Devoted to
TEXTILE
HEMISTRY
LEACHING
DYEING
PRINTING
FINISHING

EMBER 23, 1946
UME 35, No. 19

UNIVERSITY OF
NEBRASKA
OCT 10

AMERICAN
DYESTUFF REPORTER

CIAL PUBLICATION
of the
PROCEEDINGS
ICAN ASSOCIATION
TEXTILE CHEMISTS
AND COLORISTS

Opening a new field

Geigy scientists have added a real brilliance to the universally recognized Erio Chrome Colors with

Erio Chrome Brilliant Red B L

Presenting fine levelling qualities, with good fastness to *light*, *washing* and *fulling*, Erio Chrome Brilliant Red B L offers to the makers of fine Woolens and Worsteds a genuine Erio Chrome Color of assured "wearing" qualities and brightness.

Sports wear likewise is enhanced with this brightness, coupled with fastness to *Salt-Water*, *perspiration* and *water*. Erio Chrome Brilliant Red B L offers a saleability to your garments you cannot afford to overlook.

Circular 919 will be a helpful reference . . . a product sample will be convincing.

GEIGY COMPANY, INC.

89-91 BARCLAY STREET — NEW YORK — NEW YORK

Boston · Providence
Philadelphia · Charlotte
Toronto · Portland, Ore.

Geigy
Dyestuff Makers Since 1859

In Great Britain
The Geigy Co., Ltd.
National Buildings
Parsonage, Manchester

The FINISH tells the Story!

In sports or sales, the finish tells the story. When buying hosiery or other textile products, today's exacting customer demands "good looks."

For wet-goods processing of all types there is a standard or special Fancourt formula designed for your product. No matter what your finishing problem, Fancourt experience and "know-how" will create a *winning finish* for you.

Aquapel—the ideal spot and water repellant . . . for all textile products.

W. F. FANCOURT & CO.

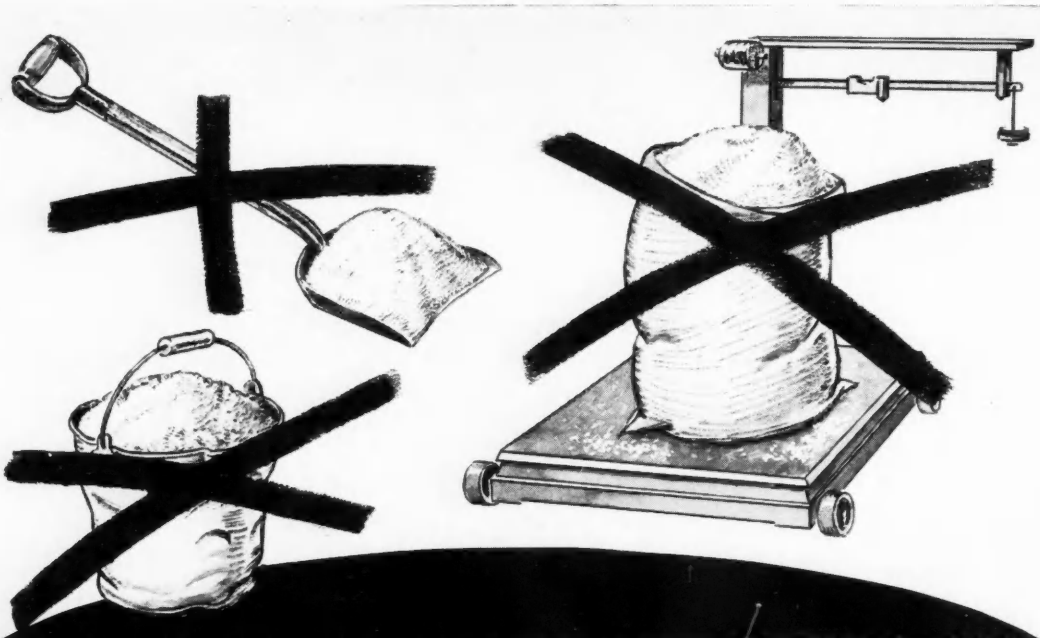
PHILADELPHIA, PA.

In the South, Howard A. Virkler, Greensboro, N. C.

Solving Finishing Problems Since 1904

American Dyestuff Reporter, Vol. 35, No. 19, September 23, 1946, published every other Monday. Copyright 1946, by Howes Publishing Co., One Madison Ave., New York 10, N. Y. Domestic subscription, 5.00; Canadian, $6.00; Foreign, $6.00. Entered as second-class matter, November 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

QUALITY
GDC
SERVICE
DEPENDABILITY
GENERAL DYESTUFF CORPORATION



FOR MODERN ACCURATE SALT MEASUREMENT YOU "PASS the SALT" by LIXATOR

Measurement of salt by dry volume in shovels, pails or containers is *hit-or-miss* . . .

Measurement of salt by weight without regard to water absorbed during damp weather and long storage is *hit-or-miss!*

But measurement by saturated-brine volume is accurate . . . *because* each gallon of 100% saturated brine always contains 2.65 pounds of salt. The Lixate Rock Salt Dissolver always produces 100% saturated, crystal-clear brine, and eliminates inaccurate measurement by dry volume or weight.

Brine-strength control is sure when you start with 100% saturated brine from a Lixator. A definite volume of Lixate brine supplies a definite quantity of salt, and dilution to any desired degree is easy and accurate. The use of too much or too little salt as an exhausting agent is avoided. The exactly correct amount of salt needed can be most easily measured in the form of saturated brine eliminating uneven dyeing, spotty goods and white edges.

And remember, your Lixator also supplies crystal-clear, 100% saturated brine for zeolite water softeners.

Textile dyers everywhere report Lixate brine gives them more level dyeing, greater efficiency, and thoroughly accurate salt measurement.

JUST MAIL THIS COUPON

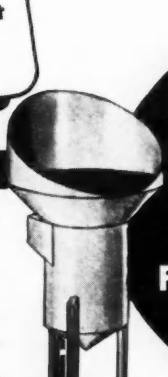
Get the whole story in our free booklet: "How Lixate Brine Solves the Problem of Accurate Salt Measurement."

*Name*_____

*Firm*_____

*Street*_____

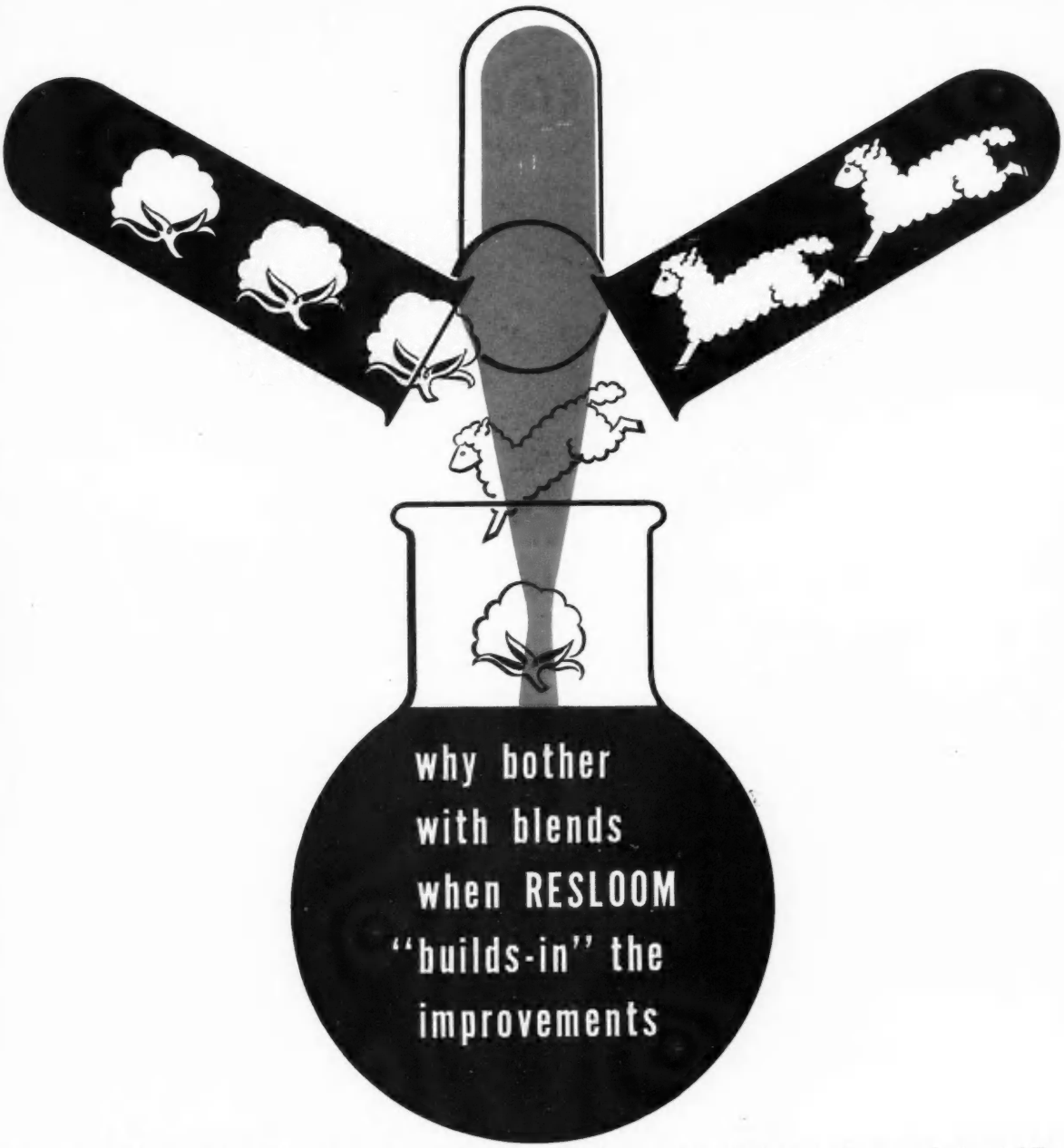
*City*_____ *State*_____



The LIXATE *Process* FOR MAKING BRINE

★ ★ ★

INTERNATIONAL SALT COMPANY, INC.
Scranton, Pa.



Progressive producers of fine textiles today are developing new fabrics by blending mixtures of cotton and rayon, rayon and wool, viscose and acetate rayons, as they vie for consumer favor.

But still greater opportunities lie ahead for the producer of fine textiles who "builds-in" superior and unique qualities with Resloom without the headaches of mixed fiber dyeing and finishing. Resloom imparts the resilience of wool to rayon fabrics and imparts new stability to cotton and to wool.

In fact, Resloomed rayons are lower in cost than rayon-wool blends and possess better stability and washability.

An Opportunity . . .

To produce a truly new fabric, build Resloom into a rayon-acetate blend to impart outstanding crush resistance, washability, and fabric stability.

The experienced help of Monsanto textile technicians is at your command. Also, full data and samples may be had for the asking; simply write: MONSANTO CHEMICAL COMPANY, 140 Federal St., Boston 10, Massachusetts.

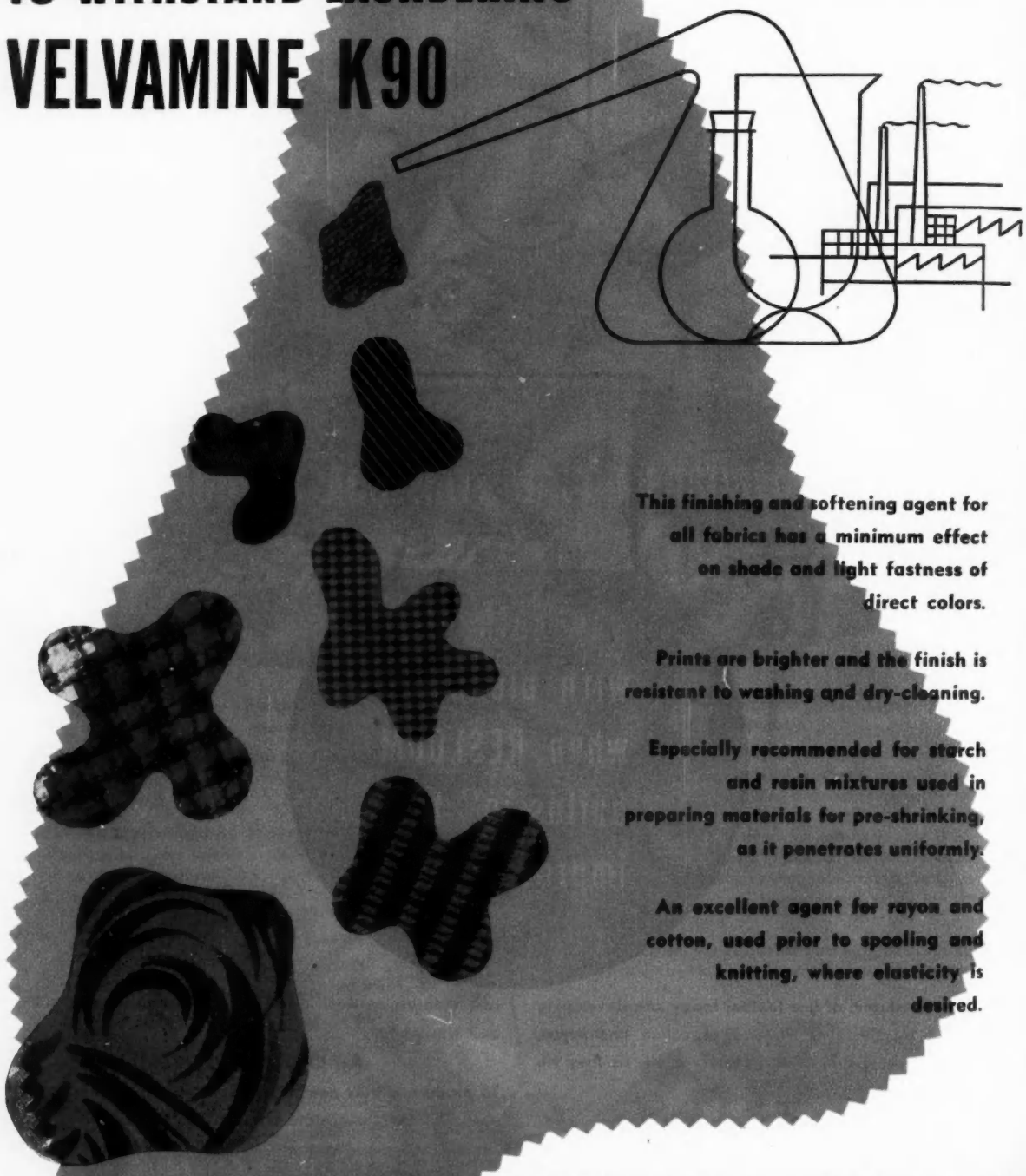
Resloom: Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS AND PLASTICS
SERVING INDUSTRY...WHICH SERVES MANKIND

PATTERN FOR PRODUCING BRIGHTER PRINTS...

TO WITHSTAND LAUNDERING

VELVAMINE K90



This finishing and softening agent for all fabrics has a minimum effect on shade and light fastness of direct colors.

Prints are brighter and the finish is resistant to washing and dry-cleaning.

Especially recommended for starch and resin mixtures used in preparing materials for pre-shrinking, as it penetrates uniformly.

An excellent agent for rayon and cotton, used prior to spooling and knitting, where elasticity is desired.

REFINED PRODUCTS COMPANY

Lyndhurst • New Jersey

***Manufacturers of PERMA-CIDE, the approved, outstanding, mildew-proofing agent**

Southern Representative: DYER S. MOSS, 1301 Liberty Life Bldg., Charlotte, North Carolina

New England Representatives: E. L. LEGG, P. O. Box 597, Providence, R. I.
CLARENCE E. MOSS, 19 Wilson Ave., Rumford (16) R. I.

Canadian Selling Agents: Berkeley Products Canada, Ltd., 41 Hillcrest Avenue, St. Catharines, Ontario, Canada • Exporting Agent: Chem-Cel Company, 82 Wall St., New York City

GLYOXAL

O O
" "
HC-CH

is now a tank car chemical

REACTIVE!

Now for the first time the many reactions of this interesting chemical—known in the laboratory for nearly 90 years—can be put to work in large-scale industrial processes. With Glyoxal as a chemical building block, many new and improved textiles, resins, adhesives, dyes, pharmaceuticals, and paper products are being developed.

Besides its unusually great reactivity—due to *two* functional groups—Glyoxal has the advantages of mild odor and relatively low volatility. It is an easy-to-use modifying and insolubilizing agent for cellulose, starch, and other polyhydroxyl compounds. A new process for improving dimensional stability of rayon fabrics has been developed through the use of Glyoxal.

Its reaction with proteins is characteristic of the hardening effects of aldehydes on such materials, but has the advantage that smaller quantities of Glyoxal are required. Glyoxal will react with simple nitrogen compounds and with phenols to form dyestuffs and pigments. With aliphatic amines, Glyoxal forms compounds which may be useful as detergents and stabilizers for mineral oil lubricants.

Call or write our nearest office for a sample and Form 5754, which gives further technical data.

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York 17, N. Y.

Offices in Principal Cities

SYNTHETIC ORGANIC CHEMICALS

SULFRAMIN

A SYNTHETIC ORGANIC DETERGENT; EFFECTIVE EVEN IN DILUTIONS OF 1 to 10,000

OF SPECIAL INTEREST TO THE TEXTILE INDUSTRY...

SULFRAMIN DT and SULFRAMIN LW (Powder) Powerful synthetic detergents and foaming agents unsurpassed wherever hard water presents a problem. LW has a higher lauric content, and consequently is preferred when used in water colder than 50° C. Textile processors and manufacturers of dyeing assistants, use either type, depending upon the temperature of the solution.

SULFRAMIN DH (Paste) A concentrated, slightly alkaline detergent offering great money value as an all around boil-off compound. It is adaptable to the manufacture of various scouring, boiling-off and dyeing assistants; and is usable under any water conditions.

SULFRAMIN DR A neutral compound of high wetting and scouring qualities, having the appearance of a clear, sulphonated oil. It is immediately soluble in hot or cold water, and is therefore an ideal dyeing assistant. It can be employed advantageously as a straight product or in conjunction with various sulphonated oils.

SULFRAMIN DHL A clear, leveling agent having the appearance of a sulphonated oil; and suitable for solving your most vexing dyeing problems. It has powerful leveling and penetrating qualities, and assures complete satisfaction in the processing of rayon and acetate fabrics.

SULFRAMIN DT (Paste) A strictly neutral, synthetic detergent, with good wetting qualities and complete resistance to hard water. Manufacturers of dyeing assistants, and textile processors, use it principally in scouring and dyeing preparations. Being neutral, DT is particularly useful in alkaline solutions.

SULFRAMIN N This is a non-foaming wetting agent, having the appearance of a heavy paste. Although of radically different chemical structure, Sulframin N shares many of the advantages inherent in many of the other Sulframin products. Its strongest feature is its complete immunity to the effects of inorganic acids and alkalies. Consequently, it is preferred in the processing of wool, such as in carbonizing, in dyeing, etc. Not only is Sulframin N an outstanding leveling agent; it can also be safely employed with any amount of alkali.

ULTRA Chemical WORKS

ULTRA CHEMICAL WORKS, Inc.

• PATERSON, N. J. • IN CANADA . . . Delta Chemical Company, Brantford, Ontario

• CHICAGO, ILL. • IN MEXICO . . . Icon, S. A., Mexico, D. F.

EASTMAN BLACK SN NEW

For Dyeing Cellulose Acetate Rayon

EASTMAN BLACK SN New is a highly refined soluble dye base. Diazotized and developed with beta-oxy naphthoic acid, it dyes acetate rayon dense greenish shades of black which retain their cast under both daylight and artificial light.

When heated with direct steam, Black SN New will not tar in a water medium. It is highly recommended for cross dyeing since it stains viscose rayon and cotton only slightly. At low temperatures, it penetrates and levels well with good exhaustion of the dyestuff. Blacks obtained with this dye by either jig or box method meet general commercial fastness requirements and offer exceptional resistance to sublimation and crocking.

Eastman Acetate Dyestuffs are available in a wide variety of useful colors which have been especially developed for cellulose acetate rayon. For additional information concerning these dyestuffs and their application to synthetic fibers, address your letter of inquiry to the TENNESSEE EASTMAN CORPORATION (Subsidiary of Eastman Kodak Company), KINGSPORT, TENNESSEE.

Eastman
ACETATE DYESTUFFS

you'll get REAL YARN PROTECTION

(Photograph courtesy Universal Winding Co., Providence, Rhode Island)

Here are some of the principal reasons why NOPCO Nylon Coning Oil can be a big help to you in attaining better coning and knitting results.

A firmer bonding material. NOPCO Nylon Coning Oil tends to bind the size to the nylon yarn. This binding action results in minimum flaking, adequate and lasting yarn lubrication.

Non-emulsifying. *Insoluble* NOPCO Nylon Coning Oil checks the over-plasticizing effect of water on the size during knitting. Result—less stripping, rapid fabric drying. This makes for both reduced roll and increased snag resistance.

Clear, even stitch formation. This is another advantage assured because NOPCO Nylon Coning Oil gives essentially uniform lubrication throughout the coning process. That's how NOPCO Nylon Coning Oil *really protects yarn* . . . how it gives valuable aid in keeping product volume and quality up and production costs down.

"BOOM DAYS" for nylon lie ahead. Competition will be keen. It will pay you to give your nylon yarn the protection of a dependable coning oil such as Nopco. For further particulars write address below:

NATIONAL OIL PRODUCTS CO.
HARRISON, N. J.
Branches: Boston • Chicago • Cedartown, Ga. • Richmond, Calif.

NOPCO EVOLVED THROUGH RESEARCH
*REG. U. S. PAT. OFF.

NOPCO CONING OIL
FOR NYLON YARN PROTECTION

PRINTING ON *Vinyl Film*

NOW DONE SUCCESSFULLY BY MACHINE OR SCREEN

To provide fast-color prints on vinyl film, Aridye technicians have developed a special line of Aridye* Pigment Colors, together with a simple process of application. These new colors, known as the "V Series," are available in a wide range of shades and have already won favor among textile printers for application by either machine or screen printing.

Among the first of these textile printers to adopt the "V Series" of Aridye Pigment Colors was Millbank, Inc., Passaic, N. J., a leader in the field of novelty printing. An example of Millbank's work is the attractive Bow-Knot pattern on the shower curtain (shown above) now being featured by Scranton Lace Co. in its advertising promotion, under the name Craftspun.

Here is how Millbank printed this striking shower curtain design. (1)—The tinted vinyl film was roller printed with Aridye White VI cut with Aridye Clear 6452. (2)—After printing, the film was dried and shelled up on rolls. No ageing or washing was necessary.

The printing of vinyl film in one or more color designs is yet another example of the versatility of Aridye Pigment Colors. Aridye colors are also being widely used on vinyl-coated fabrics, Fiberglas, Vinyon, Saran, nylon, high-tenacity rayon, and other synthetics. On cottons and blends, too, users have found that Aridye Pigment Colors have equally distinctive advantages.

Why not have an Aridye technical service man discuss your printing or dyeing problems with you? Write Aridye Corporation —Pioneers in Pigment Colors for Textiles—Fairlawn, New Jersey.

*Reg. U.S. Pat. Off.

CHECK THESE EIGHT ADVANTAGES

Sharpness of Mark • Exceptional Fastness to Sunlight
Uniformity of Shade • Fastness to Washing • Bright Colors
Economy • Ease of Application • No Impairment of Hand

Pigment colors

ARIDYE CORPORATION • A SUBSIDIARY OF INTERCHEMICAL CORP., FAIRLAWN, N. J. • ROCK HILL, S. C. • PROVIDENCE, R. I.

SILVER JUBILEE ISSUE

TO BE PUBLISHED DECEMBER SECOND

THE Silver Jubilee Issue will carry a complete history of the A.A.T.C.C., a factual account of the struggle for tariff protection which made the development of the American synthetic organic chemical industry possible, numerous articles written by persons designated by the A.A.T.C.C. as best qualified to cover specific phases of chemical accomplishment, and further articles of a more personal nature written by individuals whose positions and contacts qualify them to speak with authority on textile chemical affairs throughout the last twenty-five years.

The Synthetic Organic Chemical Manufacturers Association has prepared a history of their Association (which also is celebrating its twenty-fifth anniversary this year), and the inclusion of this twenty-five-year history of the S.O.C.M.A. will be an important feature of the issue.

It is the purpose of the American Association of Textile Chemists and Colorists to make the Silver Jubilee Issue a permanent historical record of American achievement in the field of textile chemical research and development, and the issue offers a rare opportunity for manufacturers to acquaint their customers with the historical background of their organizations, the products they manufacture, the technical cooperation available, etc.—information so important in the promotion of good will.

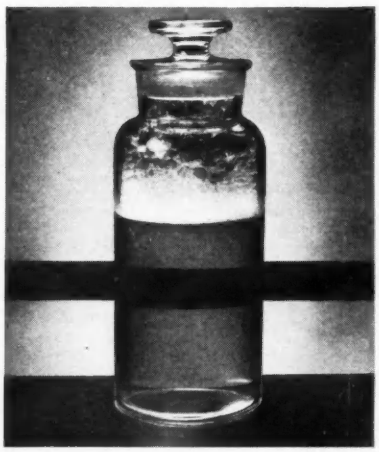
Advertising space reservations must be made immediately to assure good position. Telephone, wire or write today.

HOWES PUBLISHING COMPANY

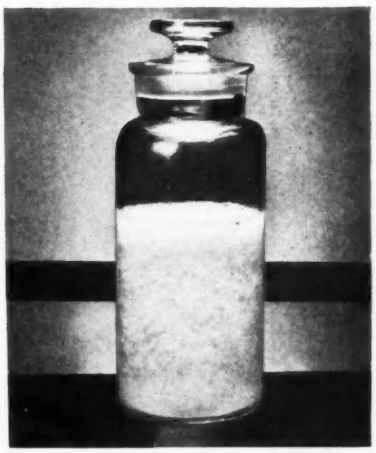
The ability of QUADRAFOS* to make less soap do more work and better work is responsible for its enthusiastic reception in many industries. Not only does QUADRAFOS completely prevent loss of soap by precipitation; QUADRAFOS also improves the performance of soap by virtue of its efficiency as a detergent, dispersing agent, and emulsion stabilizer.

SEE HOW QUADRAFOS SOFTENS WATER, PREVENTS PRECIPITATION OF SOAP, AND SAVES AS MUCH AS 75% OF THE NORMAL SOAP CONSUMPTION IN HARD WATER

A turbid, greasy mass of insoluble soap having no sudsing or cleaning power is formed when standard soap solution is added in the amount of 4 ml. per 100 ml. of water at 15 grains per gallon hardness.



QUADRAFOS completely softens the water, giving an abundant lather and a crystal-clear solution upon the addition of only 1 ml. (the lather factor for distilled water) of standard soap solution per 100 ml. of the 15 grain water.



Although alkalies such as trisodium phosphate form precipitates when added to 15 grain water, the heavy deposit of lime soap and the lack of suds show that the water has not been softened, even when twice the stoichiometric amount of alkali is used, followed by four times as much soap as needed for distilled water.

In Textiles This Means no deposits of lime soaps; whiter, loftier stock; no resists in dyeing!

In Laundry This Means brighter, snappier whites; less bleach; less soap; fewer rinses!

Wherever Soap Is Used This Means you obtain full value from every pound of soap, with no waste, better detergency and complete freedom from the lime soap nuisance.

Interested in what QUADRAFOS can do for you? Write Rumford Technical Service Department, stating your problem and contemplated application!

QUADRAFOS

*U. S. Reg. Trade Mark for Sodium Tetraphosphate made by Rumford

RUMFORD CHEMICAL WORKS

20 NEWMAN AVE., RUMFORD 16, RHODE ISLAND

Wide Range of use is Big Feature of

Indigosol Golden Yellow IGK

THE present price of Indigosol Golden Yellow IGK makes possible the use of this very fast Indigosol for economical dyeing and printing operations.

In combination with Indigosol Green IBA, very fast green shades are now available to the printer and dyer for the first time at a very reasonable cost.

An excellent printing color on cotton and rayon, it is also of great interest to the dyer of cotton, rayon and wool.

In ease of application, the perfectly level shades obtained, and the unusually excellent penetration of heavy goods makes the entire line of INDIGOSOLS especially valuable to the fast color dyer or printer.

Brightness and Economy are Characteristics of

Pharmasol Golden Yellow N

PHARMASOL Golden Yellow N produces clear, bright, fast and economical golden yellow shades when printed on cottons or rayons.

When mixed with Pharmasol Red RN, a complete range of Gold Shades can be obtained.

PHARMASOLS are solutions of stabilized azoic dyes and adjusted to the most practical concentration which can be easily applied with a maximum of efficiency.

PHARMASOLS solve the problem of troublesome dissolving and the uncertainties thereof—and as there is no decomposition there can be no loss of material or value.

CARBIC COLOR AND CHEMICAL CO., INC.

451-453 Washington Street, New York City

BRANCHES:
PHILADELPHIA
PROVIDENCE HAMILTON, ONT.
CHARLOTTE, N. C.

IMPORTERS OF THE MANUFACTURES OF
DURAND & HUGUENIN S. A.
BASLE, SWITZERLAND

EXCLUSIVE DISTRIBUTORS OF
PHARMASOLS
PHARMOLS
PHARMACINES

Representative: Los Angeles (Hathaway Allied Products)

AMERICAN DYESTUFF REPORTER

LOUIS A. OLNEY, D.Sc.
Directing Editor

NORMAN A. JOHNSON, B.T.C.
Managing Editor

MYRON D. REESER
Advertising Manager

GRACE B. BURTON
Production Manager

M. H. MORGAN
Circulation Manager

Official Publication of the Proceedings of the American Association of Textile Chemists and Colorists

Published every other Monday by
HOWES PUBLISHING COMPANY, INC.
One Madison Avenue, New York 10, N. Y.

A. P. HOWES
President

C. R. HOWES
Vice President

H. F. CRAWFORD
Treasurer

M. D. REESER
Secretary

C. ESSENBREIS
Asst. Secretary

Also Publishers of
KNIT GOODS WEEKLY
TEXTILE COLORIST
AND CONVERTER

SEPTEMBER 23, 1946

VOLUME 35 NUMBER 19

Contents

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

• Special Articles

A Systematic Scheme of Identification for Organic Finishing Agents 449
John H. Skinkle

Fibrous Proteins 452

Filament Thickness and its Significance to the Dyer 455

Abstracts of Some of the Papers Presented at Meeting of Division of Cellulose Chemistry, American Chemical Society..... 461

• Departments

Patent Digest 457
Paul Wengraf

Trade Notes—New Products..... 462

• Proceedings of the American Association of Textile Chemists and Colorists

Plans for Intersectional Contest.....P466

October 26th Meeting, Southeastern Section.....P466

Membership Applications P466

Report of the Nominating Committee.....P468

Employment Register P468

Calendar of Coming Events.....P468

— —

Copyright, 1946, Howes Publishing Co., Inc.

Sports ensemble from
Korday Sportswear, Inc.
Fabric by Princeton Knitting Mills.

HERE'S *Wool* THAT WON'T SHRINK

Lucky lamb! His coat never gets too small, no matter how often it is washed. Mother Nature sees to that.

Lucky girl! She's wearing a woolen sports ensemble which can also be washed over and over again without shrinking out of size and shape. *LANASET** Resin sees to that.

And *LANASET* Resin has scored another *first*. Right now, there are available, for consumer markets, substantial quantities of shrinkage-controlled knitted wool merchandise. Leading department stores throughout the country are offering *LANASET* Resin-treated garments made of Princeton Knitting Mills fabric for fall and winter selling.

LANASET Resin is a melamine resin that is planned right into the development of woven and knitted fabrics to control wool shrinkage and felting. At the same time it stabilizes the fibers and guards the natural beauty, texture, absorbency and other desirable characteristics of wool.

Investigate *LANASET* Resin today. The advantage of washability will assure bigger sales and more satisfied customers for *your* wool merchandise. We invite your inquiries and shall be glad to have our technical staff consult with you in planning new fabric constructions and finishes with *LANASET* Resin. Our Textile Finishing Bulletin No. 112, "Wool Shrinkage Control with *LANASET* Resin", is also available on request.

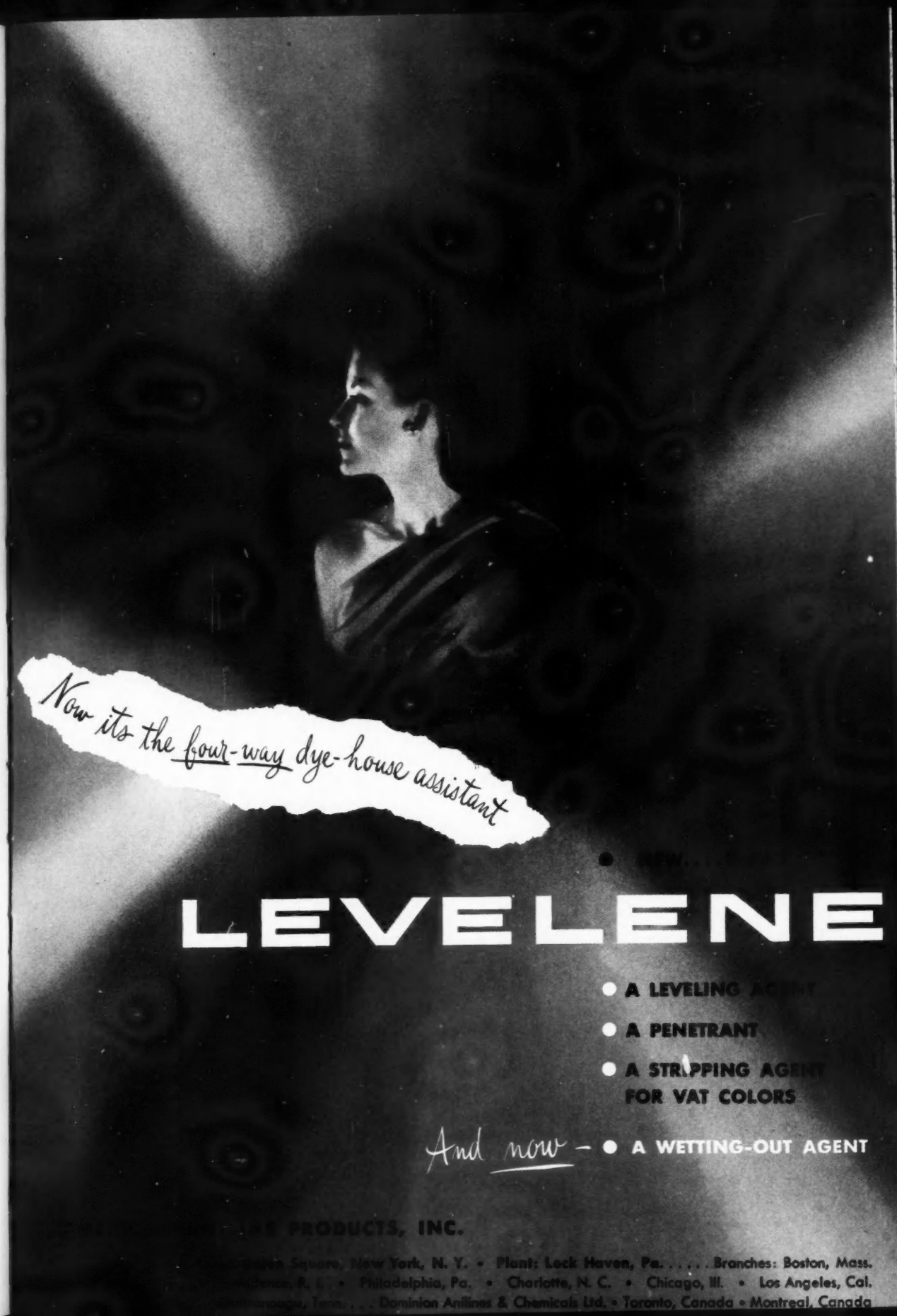
Lanaset RESIN
FOR WOOL SHRINKAGE CONTROL

AMERICAN CYANAMID COMPANY
TEXTILE RESIN DEPARTMENT
BOUND BROOK, NEW JERSEY
New York • Boston • Philadelphia
Providence • Charlotte • Chicago

LANASET Resin • *SHEERSET*† Resin • *AEROTEX*† Softener H • *LACET*† Resin

*Reg. U. S. Pat. Off. †Trade-mark of American Cyanamid Company

DO YOU KNOW
National Aniline is the sole American producer of every class of aniline dye and color.
National Aniline offers the industry's broadest experience in color application in every field where aniline dyes are used. May we work with you on your next color match?
WHEREVER COLOR IS USED
National Aniline
DIVISION OF
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET NEW YORK 6, N. Y.
BOSTON • PROVIDENCE • PHILADELPHIA • CHICAGO • SAN FRANCISCO • CHARLOTTE
GREENSBORO • ATLANTA • NEW ORLEANS • CHATTANOOGA • PORTLAND, ORE. • TORONTO


Now its the four-way dye-house assistant
LEVELENE
• A LEVELING AGENT
• A PENETRANT
• A STRIPPING AGENT FOR VAT COLORS
And now – • A WETTING-OUT AGENT
PRODUCTS, INC.
Square, New York, N. Y. • Plant: Lock Haven, Pa. . . . . Branches: Boston, Mass.
Philadelphia, Pa. • Charlotte, N. C. • Chicago, Ill. • Los Angeles, Cal.
Dominion Anilines & Chemicals Ltd. • Toronto, Canada • Montreal, Canada

DURABLE WATER REPELLENCY at Low Cost

WITH

REPEL-O-TEX

HERE is DURABLE water repellency that can be applied to any properly prepared cotton, rayon or wool fabric with no extra handling in the mill. Repel-O-Tex-treated fabrics require no curing, washing or after-treatment. They can be handled in the normal manner. This means DURABLE water repellency at no greater cost than is produced by ordinary fugitive water-repellent finishes.

Fabrics treated with Repel-O-Tex D3 and D4 conform to all standard Government wash and dry cleaning tests. Spray ratings of 100 are obtained after treatment, and of 70 or better after three dry cleanings or three washings. This falls well within the limits of accepted standards. What's more, they are also stain and perspiration resistant.

By varying mixtures of Repel-O-Tex D3 and D4 in any required proportion, you get not only DURABLE effective water repellency, but also any desired hand or finish.

For such low cost improvement in DURABLE water repellency and finish . . . more merchandising appeal . . . investigate Repel-O-Tex.

ONYX OIL & CHEMICAL COMPANY

JERSEY CITY 2, N. J.

CHICAGO • PROVIDENCE • CHARLOTTE • ATLANTA • LOS ANGELES

In Canada: ONYX OIL & CHEMICAL CO., LTD.—MONTREAL, TORONTO, ST. JOHNS, QUE.

For Export: ONYX INTERNATIONAL, JERSEY CITY 2, N. J.

onyx CHEMICALS FOR DYEING AND FINISHING

AMERICAN
DYESTUFF REPORTER

VOLUME 35 SEPTEMBER 23, 1946 NUMBER 19

A Systematic Scheme of Identification for Organic Finishing Agents

JOHN H. SKINKLE

Assistant Professor, Chemistry and Dyeing Department, Lowell Textile Institute, Lowell, Massachusetts

FOR a good many years, the identification of finishing agents on textile fabrics has been a matter of trial and error. In the case of inorganic materials, it is true, an ashing or a Kjeldahl digestion may be performed, followed by a regular qualitative inorganic analysis of the resulting material; this is satisfactory and needs no further description. Organic materials, on the other hand, had to be guessed at, tested for, and if the first guess did not happen to be correct, further guesses and trials were made. This is obviously inefficient in principle and if several agents are present, one or more may be missed entirely.

The present suggested scheme of analysis is similar in principle to inorganic qualitative analysis in that certain groups are first determined to be present or absent and if present are then progressively analyzed for the individual components in that group. The group reagents are solvents which dissolve certain classes of substances and subsequent evaporation of the solvent shows the presence or absence of the group. In order to avoid time-consuming Soxhlet extractions, a simplified procedure is used, which, while not absolutely quantitative is sufficiently so for a qualitative analysis. As a matter of fact, it is possible to obtain not only qualitative but also fairly good quantitative results by weighing the fabric after each group solvent.

Because of the fact that most of the antiseptics or mildew-proofing agents are present in such small amounts that micro or semi-micro methods are necessary, they have been mostly omitted from this scheme of analysis. Certain other finishing agents have not been included because (1) authentic samples could not be obtained, (2) because they have come onto the market too recently to be included in the investigation which resulted in this scheme, or (3) because they have not yet been definitely established as commercially acceptable finishes. It is hoped that these finishes may be fitted into the scheme of analysis as soon as possible.

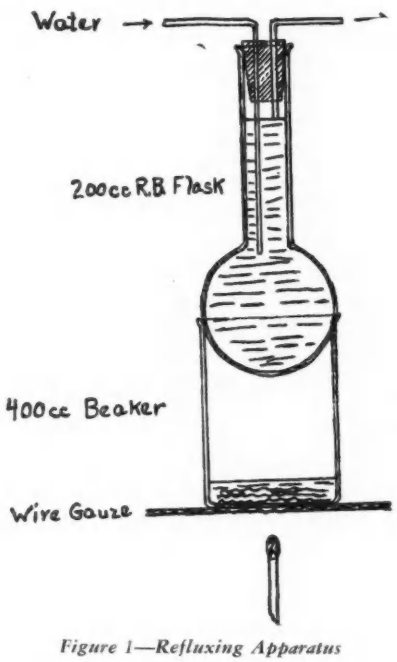


Figure 1—Refluxing Apparatus

The author is unable to acknowledge all his sources of information but he is most indebted to the Year Book of the A.A.T.C.C. and also to an article in *Industrial and Engineering Chemistry, Analytical Edition 16*, 541(1944). The carbazole test for formaldehyde derivatives, given as D3, is original with the author, so far as he knows, and is much superior to the ordinary carbazole test in delicacy and also in the fact that the reagent is permanent for at least a year, whereas the original reagent had to be made up fresh for each test.

This scheme has been tried out in detail on over twenty different fabrics and in part on at least thirty more, each fabric differing in the kind and amount of finishing agent. A little experience is necessary in judging the significance of group residues; practically all wool samples, for instance, will leave at least a trace in Groups A and B, due to small amounts of oil and soap from processing; these should be reported as traces so that it will be realized that they do not constitute a deliberately added finishing agent. The method is rapid, about an hour being required for a determination in which two or three components are present.

The apparatus required consists of a round-bottomed flask arranged for refluxing the liquid which is contained in a 400 c.c. beaker as shown in Figure I, several 2½-inch porcelain casseroles, and test tubes. It is also convenient to have a hood and electric hot plate for evaporations, but an inverted funnel connected to a filter pump and held over a ringstand may be used in an open laboratory if desired. The chemicals and reagents to be used will be designated in the various tests. The test procedures are as follows:

Cut out discs of the fabric of such

size as to just cover the bottom of the 400 c.c. beaker. Use enough discs to give 3 to 5 grams of sample. Place the extraction liquid in the beaker and place under the reflux flask.

A. Using 50 c.c. of carbon tetrachloride, heat to boiling and boil for a total time of 5 minutes. Pour off the solution into a casserole (Solution A.). Add 50 c.c. more of the same solvent to the beaker and repeat the extraction, discarding this solution (save for recovery of solvent, if desired). Allow the sample to dry on a watch-glass before the next extraction, using an oven if available.

B. Using the sample from A, repeat the whole procedure using 50 c.c. of 95 per cent ethyl alcohol both times.

C. Using the sample from B, repeat the whole procedure using 50 c.c. of distilled water both times.

D. Using the sample from C, repeat the whole procedure using 50 c.c. of dioxane both times.

E. Using the sample from D, repeat the procedure using 50 c.c. of distilled water to which 2.0 c.c. of concentrated hydrochloric acid has been added. The second boiling may be omitted and the sample discarded after the first boiling unless fiber testing is to be done on the finish-free fabric.

There are now five separate solutions each of which contains certain finishing materials which are to be tested for individual components. Tables I to V give an outline of the tests to be performed and the following detailed instructions will give the procedures in more detail. It is, of course, absolutely necessary that the tests be performed in the proper order since each test pre-supposes that certain materials have been eliminated.

Group A.—Oils, waxes, styrene resin, vinyl acetate resin, ethyl cellulose, stearamide.

A1—Evaporate solution A to dryness in the casserole.
- a. No residue = Group A not present
- b. Liquid residue = oils
- c. Solid residue = waxes, styrene resin, vinyl acetate resin, ethyl cellulose, stearamide

A2—Attempt to dissolve residue Alc in acetone, warming if necessary.
- a. Residue = styrene resin
- b. Solution = waxes, vinyl acetate resin, ethyl cellulose, stearamide

A3—Evaporate solution A2b to dryness, to part of the residue add a few cubic centimeters of 10 per cent potassium hydroxide, boil several minutes, filter, acidify with concentrated hydrochloric acid, heat to boiling, and allow to cool.
- a. Suspension = stearamide

A4—Attempt to dissolve the remainder of the residue from the first part of A3 in petroleum ether.
- a. Solution = wax
- b. Residue = vinyl acetate resin, ethyl cellulose

A5—To the residue A4b, add a few drops of concentrated hydrochloric acid and 1 c.c. of water, warm for 10 minutes, place in a test tube, filtering if not clear. Add a few drops of 5 per cent lanthanum nitrate solution and one drop of dilute iodine solution, make alkaline with a few drops of concentrated ammonium hydroxide solution.
- a. Brown or blue color = vinyl acetate resin
- b. No color = ethyl cellulose

(Dilute iodine solution consists of 1 gram iodine and 20 grams potassium iodide in 500 c.c. of water)

Group B.—Soaps, sulfonated oils, sulfated alcohols, cationic softeners, phenols or cresols, glycerine or glycols.

B1—a. To a few cubic centimeters of solution B in a test tube, add an equal volume of concentrated hydro-

TABLE I

GROUP A (Carbon tetrachloride extract)

Evaporate to dryness

- Liquid: **OIL**
- Solid: Waxes, styrene resin, vinyl acetate resin, ethyl cellulose, stearamide

Test with acetone

- Insoluble: **STYRENE RESIN**
- Soluble: waxes, vinyl acetate resin, ethyl cellulose, stearamide

Evaporate to dryness

- Part of residue: Dissolve in KOH, filter, acidify.
  - Suspension or Precipitate: **STEARAMIDE**
- Part of residue: Test with petroleum ether
  - Soluble: **WAX**
  - Insoluble: vinyl acetate resin, ethyl cellulose

Treat with HCl, test with $La(NO_3)_3$

Brown or blue color:	No color:
VINYL ACETATE RESIN	**ETHYL CELLULOSE**

TABLE II

GROUP B (Ethyl alcohol extract)

Solution:
a. Test with conc. HCl
b. Test with KOH

Remainder of solution: Evaporate to dryness, dissolve in boiling water, filter, cool

- b cloudier than a: **CATIONIC FINISH**
- a cloudier than b: **ANIONIC FINISH**

Boil HCl soln, filter, test with $BaCl_2$

Ppt:	No ppt:
SULF. OIL or SULF. ALCOHOL	**SOAP**

Test with $BaCl_2$

- ppt: **SULFATED ALCOHOL**

Test with HCl and $FeCl_3$

- Green, blue, violet color: **PHENOL or CRESOL**

Add $KHSO_4$, evaporate to dryness, ignite

Odor of acrolein:	Odor of acetaldehyde
GLYCERINE:	**GLYCOL**

TABLE III

GROUP C (Water extract)

If solution is not clear, filter. Evaporate half of the solution to dryness, if an appreciable residue is found, perform tests on remaining half of solution.

Test with iodine soln		Test with basic $PbAc_2$	Test with Fehling's Solution	Boil with HCl, test with Fehling's Soln.	Test with formaldehyde and $FeCl_3$	Test with a. KOH b. $HgCl_2$
Blue color:	Red or purple color	Ppt:	Yellow, orange, red color:	Yellow, orange, red color:	Violet ring:	a. NH_3 gas b. Ppt
STARCH	**DEXTRINE**	**GUMS MOSSES ALBUMEN**	**GLUCOSE**	**CANE SUGAR**	**CASEIN**	**AMMONIUM SULFAMATE**

TABLE IV
GROUP D (Dioxane extract)

Evaporate to dryness, test with toluene

Soluble: ACRYLATE RESINS	Insoluble: phenol-formaldehyde resin, alkyd resin, cellulose nitrate, cellulose acetate, vinyl chloride resin, vinyl chloride-acetate resin

Dissolve small portion in HCl, test with carbazole

Blue color: PHENOL-FORMALDEHYDE RESIN	No blue color: alkyd, cellulose acetate, cellulose nitrate, vinyl chloride, vinyl chloride-acetate

Test with glacial acetic acid

Soluble: alkyd, cellulose acetate, cellulose nitrate. Evaporate to dryness			Insoluble: vinyl chloride, vinyl chloride-acetate. Test with pyridine	
Test with phenol	Test with diphenylamine	Test with $La(NO_3)_3$	Soluble: VINYL CHLORIDE-ACETATE RESIN	Insoluble: VINYL CHLORIDE RESIN
Red color	Blue color:	Brown or blue color		
ALKYD RESIN	CELLULOSE NITRATE	CEL. ACETATE		

TABLE V
GROUP E (Dilute hydrochloric acid extract)

Small portion	Small portion		Remainder: evaporate to dryness		
Test with picric acid	Test with carbazole		Test with formaldehyde and $FeCl_3$	Test with glacial acetic acid	
Ppt:	Blue color:	No blue color, no picric acid ppt, but a group residue:	Violet ring:	Soluble:	Insoluble:
PYRIDINE DERIVATIVE	FORMALDEHYDE RESIN	VINYLIDINE RESIN	CASEIN-FORMALDEHYDE	UREA-FORMALDEHYDE RESIN	MELAMINE-FORMALDEHYDE RESIN

chloric acid and then double the total volume by adding distilled water.

b. To a few cubic centimeters of solution B in a test tube, add an equal volume of 10 per cent potassium hydroxide and then double the total volume by adding distilled water.

If Blb is markedly cloudier than Bla = cationic finish

If Bla is markedly cloudier than Blb = soap, sulfonated oil, sulfated alcohol

B2—If soap, sulfonated oil, or sulfated alcohol is found present in Bl, heat Bla to boiling, filter, cool, and add one or two drops of 10 per cent barium chloride solution.

a. No precipitate = soap

b. Precipitate = sulfonated oil, sulfated alcohol

B3—Evaporate to dryness the remainder of solution B not used in Bl.

a. No residue = Group B not present

B4—Dissolve the residue from B3 in boiling water, filter, and cool. To approximately one-third of the solution add 10 per cent barium chloride solution.

a. Precipitate = sulfated alcohol

B5—To approximately one-third of the solution from the first part of B4, add one or two drops of concentrated hydrochloric acid and one drop of 10 per cent ferric chloride solution.

a. Green, blue, or violet color = phenol or cresol.

B6—To approximately one-third of the solution from the first part of B4, add several crystals of solid potassium bisulfate, evaporate to dryness, and ignite the residue.

a. Odor of acrolein = glycerine

b. Odor of acetaldehyde = glycol

Group C.—Starch, dextrine, sugars, gums, mosses, methyl cellulose, soluble proteins, ammonium sulfamate.

C1—If the solution is not clear, filter it—the residue is probably China clay or other mineral weighting. Evaporate half of the solution to dryness.

a. Residue = Group C present

b. No residue = Group C not present

C2—To a few cubic centimeters of the remaining solution, add several drops of dilute iodine solution.

a. Blue color = starch

b. Red or purple color = dextrine

C3—To a few cubic centimeters of solution, add several drops of basic lead acetate solution, allow the mixture to stand for 10 minutes.

a. Precipitate or appreciable cloudiness = gums, mosses, albumen

(Basic lead acetate is prepared from 30 grams of lead acetate, 10 grams of litharge, and 5 c.c. of water stirred on a water bath until white. 100 c.c. of water is then stirred in, the reagent allowed to settle, and filtered.)

C4—Heat a mixture of 5 c.c. each of Fehling's Solution A and B to boiling, add a few drops of solution C and boil a few minutes.

a. Yellow, orange, or red color = glucose

(Fehling's Solution A contains 69.28 grams of crystalline copper sulfate per liter. Solution B contains 346 grams of sodium potassium tartrate and 100 grams of sodium hydroxide per liter)

C5—To several cubic centimeters of solution C, add a few drops of concentrated hydrochloric acid, heat to boiling and boil several minutes. Add a few drops of this mixture to boiling Fehling's solution as in C4. Omit this test if starch or dextrine was found in C2.

a. Yellow, orange, or red color = cane sugar

C6—To 5 c.c. of solution C, add one drop of concentrated sulfuric acid and one drop of 3 per cent formaldehyde solution. In another test tube, place 2 c.c. of concentrated sulfuric acid and one drop of 10 per cent ferric chloride solution. Pour the formaldehyde solution gently on top of the ferric chloride solution without mixing.

a. Violet ring = casein

C7—a. To several cubic centimeters of solution C, add 10 per cent potassium hydroxide, heat gently, and immerse wet litmus paper in the vapor.

b. To several cubic centimeters of solution C, add an equal volume of 5 per cent mercuric chloride solution.

Blue color in a. and precipitate in b. = ammonium sulfamate

C8—If a residue is found in C1 but nothing found in subsequent tests, the material is probably methyl cellulose or gelatine

Group D.—Acrylate resin, phenol-formaldehyde resin, alkyd resin, vinyl chloride resin, vinyl chloride-acetate resin, cellulose nitrate, cellulose acetate.

D1—Evaporate solution D to dryness

a. Residue = Group D present

b. No residue = Group D absent

(Vinyl chloride-acetate or cellulose ace-

tate may be from fibers present and not from finishing materials)

D2—Attempt to dissolve the residue from D1 in toluene, heating if necessary.

a. Solution = acrylate resin

b. Residue = phenol-formaldehyde, alkyd, vinyl chloride, vinyl chloride-acetate, cellulose nitrate, cellulose acetate

D3—Heat a small portion of residue D2b with 5 c.c. of water and a drop of concentrated sulfuric acid, cool to room temperature, add a few drops of carbazole reagent and one or two cubic centimeters of concentrated sulfuric acid.

a. Blue color = phenol-formaldehyde resin

b. No blue color = alkyd, vinyl chloride vinyl chloride-acetate, cellulose nitrate, cellulose acetate

(Carbazole reagent is a 0.5 per cent solution of carbazole in 95 per cent ethyl alcohol)

D4—Attempt to dissolve the remainder of residue D2b in glacial acetic acid, warming if necessary.

a. Solution = alkyd, cellulose nitrate, cellulose acetate

b. Residue = vinyl chloride, vinyl chloride-acetate

D5—Evaporate solution D4a to dryness, divide into three parts.

D6—To one third of D5, add twice as much solid phenol and one drop of concentrated sulfuric acid, heat until brown, cool, dilute with water, make alkaline with 10 per cent potassium hydroxide.

a. Red color = alkyd resin

D7—To one third of D5, add a drop of diphenylamine reagent.

a. Blue color = cellulose nitrate

(Diphenylamine reagent is prepared by dissolving 1.0 gram of diphenylamine in 100 grams of concentrated sulfuric acid)

D8—Test remaining third of D5 as in test A5.

a. Brown or blue color = cellulose acetate.

D9—Attempt to dissolve residue D4b in pyridine or tetrachlorethane, using heat if necessary.

a. Solution = Vinyl chloride-acetate resin

b. Residue = Vinyl chloride resin

Group E.—Pyridine base waterproofing agents, vinylidene resin, casein-formaldehyde, urea: formaldehyde resin, melamine-formaldehyde resin.

E1—Retain 10 c.c. of solution E, evaporate remainder to dryness.

a. Residue = Group E present

b. No residue = Group E absent

E2—To 5 c.c. of solution E, add half as much of a saturated solution of picric acid.

a. Precipitate = pyridine base waterproofing agent

E3—To 5 c.c. of solution E, add one or two drops of carbazole reagent and one or two cubic centimeters of concentrated sulfuric acid.

a. Blue color = casein-formaldehyde, urea-formaldehyde, melamine-formaldehyde

b. No blue color = vinylidene resin

E4—If E3a gave blue color, take about one-third of residue E1a, dissolve in 5 c.c. of water containing one or two drops of concentrated sulfuric acid and test as in C6.

Violet ring = casein-formaldehyde

E5—Attempt to dissolve the remainder of residue E1a in glacial acetic acid, warming if necessary.

Solution = Urea-formaldehyde resin

Residue = Melamine formaldehyde resin.

Fibrous Proteins*

Symposium of the Society of Dyers and Colorists

The Super-Contraction of Animal Fibers

C. S. Whewell and H. J. Woods

THE decay of tension when a fiber is held stretched in hot or cold water or dilute aqueous caustic soda solution is largely ascribed to side-chain breakdown judging from X-ray photographs.

A simple method for producing super-contraction is to stretch the fiber in caustic soda solution to a high extension and allow the relaxation to take place for a time, dependent on the concentration of the reagent. The fiber is then allowed to contract in the solution for a few minutes, is washed, and under certain conditions super-contractions up to 10 per cent are obtained with Cotswold wool fibers, and up to 30 per cent by other treatments.

In connection with the phenomenon of permanent set, measurements of the residual set of fibers held stretched in steam for various times showed that, for short relaxation times, the maximum negative set or super-contraction was obtained in a few minutes.

A number of reagents have been used to promote super-contraction, but not all have proved satisfactory, probably owing to the limited conditions under which they were tried.

The above is known as "irreversible super-contraction" when some application of external force is required in order that the fibers regain their original length, but under certain conditions it has been found that by chemical treatment the fibers can be made to return to their original length spontaneously, and this is known as "reversible super-contraction."

This latter is obtained by immersing the fibers in cuprammonium hydroxide solution of known concentration for a given time when contraction takes place, then by treating with dilute sulfuric acid they regain their original length.

Nothing like this reversibility has been observed before, and an understanding of the mechanism of the phenomenon is of first-rate importance.

X-ray investigations emphasizes the distinction between this and other types of super-contraction.

Water Absorption of Keratin

A. B. D. Cassie

The older theories of water absorption are discussed; firstly the hypothesis of "solution absorption," the essential feature of which is that the solvent and solute molecules can interchange places; secondly the "capillary pore" theory which assumes that water vapor is condensed in fine pores in the keratin; thirdly the theory that there are water-attracting groups in the keratin to which water becomes attached at low vapor pressures, and as the vapor pressure is increased less firmly bound water is absorbed; and fourthly the more recent theory of "multi-molecular absorption," the main feature of which is the condensation of molecules at vapor pressures which are less than the saturation vapor pressure of the pure liquid in bulk. The conclusion drawn is that the absorption of water by keratin

* These are abstracts of papers given at a Symposium on Fibrous Proteins, arranged by the Society of Dyers and Colourists, and held on May 23, 24 and 25 at the University, Leeds, England. Papers were contributed by world authorities on natural and synthetic protein fibers, giving an international character to the Symposium. Reprinted from the Textile Manufacturer, England.

proceeds because of an entropy effect rather than because of a decrease in energy of the absorbed liquid.

The swelling energy and the absorption isotherm (a table is given relating to wool), the stress-free isotherm and wool at saturation regain are discussed and an attempt is made to show that swelling energy is an important factor for the isotherm of swelling gels, and that the absorption of heat when wool absorbs water at high regains and high temperatures is a direct reflection of its swelling energy.

The minimum swelling of wool in water which is observed at 37° C. is used to calculate the differential swelling energy at saturation regain. The value of 550g. cal. per. mole agreeing with that obtained for keratin.

It is shown that the increase in entropy due to absorbed water requires the sorbed water to be in discreet clusters, a conclusion consistent with the water repellency of cut horn keratin.

A New Approach to the Problem of the Structure of Proteins—An Investigation of the Partial Hydrolysate of Wool

A. J. P. Martin

The author has been concerned with methods for studying the complex mixtures obtained by the partial hydrolysis of proteins.

The work has been on amino-acids of which there are eighteen different kinds in wool.

The methods of classical protein chemistry proved inadequate for the task of separating the numerous peptides, and two methods employed were:

1. Ionophoresis, which makes use of the charged molecules in an electric field, and thus the fractions obtained consist of molecules carrying different charges and moving at different rates. The charge on the molecule changes with the pH of its surroundings, and substances not separable at one pH may be separable at another.
2. Partition chromatography, which depends on the distribution of the substances between two immiscible liquids, and thus depends on the difference of the energy association of the substance with the two liquids. By charging the solvents, separation into different groups results.

Examination so far has included only that fraction carrying a net negative charge which consists of peptides of aspartic and glutamic acids with neutral amino acids or with themselves. Only the faster moving peptides have been dealt with. In addition, a number of dipeptides was established and tripeptides were thought to be present.

The relative amounts of different peptides present in a partial hydrolysate of a protein are discussed and enough is known to expect that these proportions will be different for:

(a) Different peptides from the same protein, and

(b) From the same peptide in different proteins.

The Chemistry of Animal Hair

J. L. Stoves

Chemically hair, animal nails, hoofs and horns, porcupine quills and bird feathers belong to the keratin group of scleroproteins. X-ray analysis and physico-chemical studies show the more highly organized parts of keratin fibers to be composed of polypeptide chains cross-linked through salt and cystine disulfide linkage forming sheets held together by van der Waals forces, and hydrogen bonding between carbonyl and imino groups of adjacent sheets.

The chemistry of the action of alkalis and alkaline reducing agents, oxidizing agents, formaldehyde, benzoquinone, trypsin and dyes is discussed.

A load-extension curve is given for the fiber in water, Milton's reagent and hydrochloric acid and two "change in work" charts at pH values up to 10 are given for formaldehyde and benzoquinone.

The various treatments were illustrated by photomicrographic plates.

The Rubber-Like Condition of the Fibers of Animal Skin

Dorothy Jordan Lloyd and Marjorie Garrod

Protein fibers of the skin, and other connective tissues, in the presence of water or a polar solvent in their rubber-like state are discussed.

The fibrous proteins dealt with are elastin, silk, collagen and keratin (wool). The rubberiness of elastin is considered due to entropy effects, and although X-rays show no fiber diagram, signs of orientation appear on stretching as is the case with rubber. The rubber-like properties of silk are attributed to an entropy effect manifesting itself only under conditions when one type of lateral bond ceases to impose an effective resistance on the structure although a second type of bond still holds. Its thermoplastic properties are qualitatively like those of elastin, although for a given load at given temperatures the silk shows slightly less difference in extension than the elastin.

Salt links are considered largely responsible for the rubberiness of collagen, and its thermoplastic properties show for the same increase in temperature at a fixed load a much smaller decrease in the degree of extension than for silk or elastin; the load-extension curve for different temperatures being coincidental.

Keratin rubberiness properties are thought not to be so much due to entropy effects as to the mutual attraction between polar side-chains.

A Criticism of Some Theories of Multi-Molecular Adsorption Applied to Wool

G. A. Gilbert

A generalization based on published work is given of what one might expect to happen as water is added to wool.

Specific theories are then considered in detail, such as the isotherm of Peirce and Cassie respectively, and the one put forward by Brunauer, Emmett and Tiller.

The first supposes water to be present in two phases and that each hexose group of cotton can accommodate a molecule of water with great affinity and constitutes one site, whilst sites of the second type are less well defined and on them water is held by a looser type of binding, analogous to that in liquid water. This theory, it is said, must be discarded as a quantitative explanation of the adsorption of vapors by cotton and wool, but the suggestion that one fraction of water is absorbed on high affinity sites and is responsible for certain physical properties; and that the remaining water is loosely held and responsible for other properties is invaluable.

The theory of Cassie depends on the absorbate occupying two-thirds of site and suggests that they postulate a unimolecular layer on low energy sites, and as the vapor pressure begins to be comparable with the saturation pressure, a condensed multi-layer "identical with the liquid in bulk." This theory is said to be untenable as the multi-layer "identical with the liquid" is supposed to be under great pressure owing to the swollen wool.

The third theory is based on Langmuir's method of balancing condensation and evaporation for evaluating the equilibrium condition of absorption. The validity of the theory depends therefore on whether this treatment can be applied to condensed systems.

The Division of the Combined Cystine of Wool Into Four Sub-Fractions Differing in Chemical Reactivity

H. Phillips

The four sub-fractions A B C and D differing under certain experimental conditions in their reactivity with sodium-bisulfite alkalis, formaldehyde and thiolacetate acid, form the combined cystine of wool.

Reduction of sub-fraction A gives thiol groups differing in reactivity towards formaldehyde, methylene, dibromide and oxygen, and also differing from those groups derived from subfraction B. This may be due to side chain environments such as association with polar (A and B) or non-polar (C and D) side chains.

The physical properties of wool have more association with fraction A and B than with fraction C and D; and subfraction A appears to be predominant. The cross-linkages of sub-fraction A and the salt linkages give mutual support so that swelling and hydration begun by the salt linkages are restrained by the cross-linkages of A. When these are broken a breakdown of the hydrogen bonding occurs and an unextended fiber may become super-contracted. Thermal agitation of the main chains without disulfide breakdown may overcome the strained hydrogen bonding of an extended fiber. When, however, the extended and released fiber is released, super-contraction takes place but if the fiber is kept extended hydrogen bonding will cause the fiber to set and the permanency of this set can be modified by a conversion of certain cross-linkages.

The Combination of Wool With Acids and Acid Dyes

J. B. Speakman and G. H. Ellio:

X-ray examination of dyed wools gave sharply conflicting results with the long standing chemical evidence, i.e. that the combination of wool with acid dyes is the same as that for simple acids. It was found that wool dyed to saturation with crystal ponceau gave indications that unlike simple organic acids, dye acids could not delay or prevent setting of the crystalline phase of stretched fibers in steam.

Re-examination of these varying results has led to the suggestion that the combination of wool with acid dyes might still be stoichiometric in character in spite of the inability of the dye to penetrate the crystalline phase if the latter were penetrated by hydrogen ions and an equal number of dye anions were left on the surface. Thus dyed fibers would contain anions closely associated with the base side chains of the amorphous phase and anions adsorbed on the surface of impenetrable crystallites.

Curves plotted show that the reduction in the resistance to extension of the fibers due to the amount of combined acid took a sharp turn up at the end; this was proved to be due to swelling.

Again if hydrogen ions penetrate the peptide chains, setting of the crystalline phase of stretched fibers should be prevented by acid dyes but such results could not be obtained. X-ray methods were therefore applied to examine the setting properties of the crystalline phase. This was found to be greatly impaired and there was a suggestion that combination with dye had an orienting effect on the structure.

Equilibrium Between Silk and Aqueous Solutions—Internal Reaction of Silk Fibroin

T. H. Morton

In the dyehouse it was noticed that the pH value of the water extract of the finished silk was invariably more alkaline than the water in which it was finished.

The magnitude of the effect is shown in Table I for silk finished in "Permutit"-softened water, the alkalinity of which had been modified by additions of sodium hydroxide or hydrochloric acid.

This effect is due to an ionic equilibrium of the Donnan type.

Silk is best characterized chemically by its "proper reaction" or internal pH value, and for neutral silks this value is much lower than the pH of the finishing bath. The magnitude of this difference depends on the ionic strength of the aqueous solution and disappears at high salt concentrations.

TABLE I
EXTRACTS FROM NETT SILK IN 4 vol. WATER and 0.1M-NaCl

pH of wash water	*pH of extract*	
	H_2O	*0.1m-NaCl*
9.00	9.65	8.75
8.45	9.32	8.17
7.71	9.11	7.58
7.10	8.37	7.16
6.70	8.16	6.94
5.81	7.33	6.36

The outcome of ionic equilibrium has been treated theoretically and experiments have confirmed expected differences. The base-exchange equilibrium other than with neutral sodium fibroin in neutral salts is considered.

The "proper reaction" and combined alkali of fibroin has been studied and measurements obtained by testing the alkalinity of extract for fibroins containing known quantities of combined sodium hydroxide. The figures in Table IV characterize the pH of silk samples more precisely than has hitherto been possible.

The equilibrium phenomena is important in processing silk as well as in characterizing the finished product, and it is suggested that the "proper reaction" is very important whenever the chemical reactivity of fibroin is to be studied.

The Structure of Silk Fibroin and Its Bearing on Fibrous Proteins

D. Coleman and F. O. Howitt

Knowledge of the properties of proteins has been considerably advanced, mainly in two directions:

1. By the general picture of the spatial arrangement of the amino-acid residues in the molecules, and
2. By the nature and distribution of these residues.

The textile researcher is primarily concerned with the tensile properties of protein fibers such as silk or wool. The outstanding example of a protein created to function as a strong, elastic fiber is that of a spider's web which is considered to have a tensile strength about ten times that of silk and of equal extensibility.

In the search for the natural structural pattern of fibrous protein, and for the cause of the conversion of insoluble into soluble form, silk fibroin has provided a suitable material owing to its simple structure. One disadvantage has been the insolubility to dilute acids and alkalis, but a method for making the protein soluble in water has enabled more detailed examination.

The constituent amino acids of fibroin in histidine, serine and threonine, tryosine and proline have been examined, a table being given for the amino acid composition of silk fibroin.

A consideration of the amide-nitrogen content of fibroin shows that very little is present, and the rate of formation of ammonia is shown graphically.

In dealing with the preparation and properties of dispersed and water-soluble forms of fibroin the authors discuss the acidification of dissolved fibroin; the stability, mean molecular weight, titration curves, ultra-violet absorption spectra, and tyrosine-hydroxyl groups of 50/50 mixtures (50 per cent dispersed, 50 per cent water soluble) and 100 per cent water-soluble protein.

In addition the optical rotation, primary effect of tryptic hydrolysis, viscosity, films and filaments, and crystal-

TABLE IV
pH OF EQUILIBRIUM EXTRACT (50vol.) OF FIBROIN (20°C.)

Fibroin	*pH of extract*			
	Water	*0.1m-NaCl*	*m-NaCl*	*0.1m-BaCl₂*
0.1% combined HCl	4.0	....	4.3	...
Isoelectric	7.1	5.3	4.6	5.5
0.2% combined NaOH	7.4	6.2	5.3	5.5
0.4% combined NaOH	8.0	7.2	5.9	6.5
0.6% combined NaOH	9.1	8.2	6.6	7.4
0.8% combined NaOH	9.7	9.0	7.3	8.1
1.0% combined NaOH	10.1	9.6	8.0	8.8
1.2% combined NaOH	10.4	10.0	8.6	9.3

lizability on the same two forms of fibroin are discussed.

The article concludes with a discussion of the interpretation of the experimental results.

The Action of Fluorine and Fluorides on Wool

R. F. Hudson and P. Alexander

This paper gives considerable information on the reaction between fluorine and wool. Results are given of the direct fluorination of wool at various humidities and concentrations; also tables showing the necessary conditions for maximum unshrinkability.

Evidence is given supporting the view that disruption of the cystine linkage by fluorine is responsible for the anti-felting action. Treated with dilute aqueous sodium hydroxide for many hours, care being taken to avoid great accumulation of sodium sulfide, it has been found that the treatment of wool with fluorine does not reduce felting. The view is held by some that the sodium hydroxide treatment replaces the disulfide linkages by more stable cross-links which are unaffected by the anti-felting agent.

To estimate the percentage of fluorine required to produce non-feltability, the most satisfactory test made use of cobaltic fluorite as the source of fluorine. The result showed that a minimum of 0.5 per cent fluorine on weight of wool was necessary to produce non-felting wool.

It is considered that the limited anti-felting action of aqueous hydrogen fluoride is due to main chain hydrolysis, whereas disulfide breakdown is the cause of the anti-felting action of fluorine.

Effectiveness of Oxidation Anti-Shrink Treatments to Acid and Alkali Milling

P. Alexander

One method of reducing the tendency of wool to felt is the attack and breakdown of the disulfide bond, and this leads to the formation of a layer of degraded protein which swells in water and masks the scale structure.

Different oxidizing agents on wool render it unshrinkable to alkaline (soap) milling although the capacity of the fabric to shrink in acid milling remains almost undiminished.

The shrinkage of wool on milling in acid and alkali after different antishrink treatments is given in Table I, and the scaliness of untreated and potassium permanganate-treated wool fibers as measured by the "violin bow" method are given in Table II.

A sample of knitted fabric of good quality crossbred wool has been used for experiments on anti-shrink treatments, and ten different reagents were used.

Milling shrinkage, fiber damage and scaliness were measured.

Anti-shrink processes which do not remove all the scales (e.g. fluorine treatment) render wool resistant to alkali milling, but not to acid milling, and it is difficult to explain why wool shrinks when acid-milled after an alkali milling in which it did not felt.

Chlorine and sulfuryl chloride removes the scales of wool thus treated during milling, but it is difficult to see how the acid milling results can be expressed in terms of the present theory of the anti-shrink action of oxidizing agents.

The relation between the directional friction effect and felting capacity is maintained as is shown by the effect of permanganate treated fibers which are large in acid but small in alkaline solution, whereas chlorine treated fibers show little directional friction effect.

TABLE I
SHRINKAGE OF WOOL ON MILLING IN ACID AND ALKALI AFTER DIFFERENT ANTI-SHRINK TREATMENTS
(Figures in brackets show shrinkage and fiber damage, respectively, of untreated control fabric)

Treatment	*Shrinkage in solution of pH 3* %	*Shrinkage in solution of pH 10* %	*Shrinkage in solution of pH 3 subsequent to milling in column 3* %	*Fiber damage after milling in solution of pH 10* %
Fluorine	21.0 (23.5)	5.2 (24.8)	20.8 (25.2)*	12.0 (11)
Potassium permanganate	23.2 (27.0)	4.3 (21.2)	25.1 (27.1)*	16.0 (8)
Bromide in carbon tetrachloride	21.5	0.5	.....	25.0 ....
Aqueous bromine	18.0 (26.7)	7.7 (19.8)	21.5 (26.7)*	23.0 (13)
Aqueous alkaline hypochlorite	22.6 (30.2)	6.3 (30.0)	19.8 (28.0)*	32.0 ....
Aqueous chlorination (pH 1.5)	4.0 (23.6)	3.3 (20.9)	4.2 (21.2)*	88.0 ....
Chlorine in carbon tetrachloride	3.2 (23.6)	0.0 (20.9)	1.7 (21.2)*	85.0 ....
Gaseous chlorination	3.8 (21.7)	1.4 (19.8)	.....	83.0 ....
Sulfuryl chloride	7.2 (22.2)	4.2 (24.1)	11.4 (34.1)*	68.0 ....
Alcholic potassium hydroxide	7.1 (22.2)	5.3 (24.1)	11.8 (34.1)*	59.0 ....

* The control pieces had not been previously milled in alkaline solution.

TABLE II
SCALINESS OF POTASSIUM PERMANGANATE-TREATED AND UNTREATED WOOL

	Dry	*Solution at pH 3*	*Solution at pH 10*	*Transferred from solution of pH 10 to solution of pH 3*
Untreated	18	35	54	28
Potassium permanganate-treated	15	40	4	33

Filament Thickness and its Significance to the Dyer*

ONE tendency among rayon manufacturers in recent years has been to investigate the possibilities of improving rayons by changing their filament deniers. The rayon yarns made in earlier days were necessarily somewhat coarse because of the limitations imposed on rayon spinning by the methods and machinery then available. But nowadays it is possible to produce rayon filaments from 0.1 denier upwards. As might be expected this development is now being exploited.

Ordinary filaments of viscose and acetate rayons have a denier of 3 to 5. Cuprammonium rayon filaments are standardized at 1.3 denier. By contrast, cotton fibers have a denier of about 1.7 and wool around 4; silk has a filament denier of about 1. In natural fibers the filament thickness is liable to considerable variation—more so than with the synthetics.

It was soon discovered that the early rayons lacked the softness of real silk and in attempting to improve them in this respect it became recognized that increased softness could be obtained by reducing the

* Reprinted from the Dyer & Textile Printer, England.

filament denier. The softness increases very rapidly in proportion to the filament fineness and whereas a cellulose filament of, say, 8 deniers may have a bristle-like character a similar cellulose filament of 1 denier can be almost as soft as real silk. Thus it was indicated to the rayon manufacturer that all he had to do to produce more silk-like rayon was to reduce the filament denier.

Reducing the Filament Denier

Although we are not concerned here particularly with details of the manufacture of fine filament rayons it is interesting to notice that many difficulties have been encountered in producing fine filaments. Simply to decrease the diameter of the holes in the spinnerets is the easiest part. Much more difficult is filtering the cellulose or cellulose derivative spinning solution so thoroughly that these holes do not quickly become blocked by suspended impurities. Further, the filaments demand special coagulating conditions on account of the relatively high surface area which they present to the coagulating liquors. In fact, most rayon manufacturers have found it more satisfactory to spin comparatively coarse filaments and then reduce these to fine filaments by stretching. Most of the fine filament rayons available today are being produced by stretch methods.

Incidentally, it may be noted that stretching not only gives filament fineness coupled with softness; it also increases the tensile strength and reduces the extensibility of the filaments.

It is at this point that the dyer can be introduced into the discussion. Dyeing as we know it today is largely concerned with the surface of each fiber. Whether dyeing be a case of dye particles being adsorbed in the rayon fibers or dissolved in them it is obvious that all the dye must pass through the fiber surface on its way to the interior. In some rayons the dye remains fixed largely in the surface regions; in others it is found more or less evenly distributed throughout the fiber.

If we consider two rayon fibers, one having a filament denier of, say, 4, and the other 1, it may be calculated, assuming these fibers to be of smooth circular cross section, that the second fiber has a surface area per unit volume which is obviously four times greater than that of the first. *A priori* it will thus be concluded that in a dyeing process the dye will be able to pass into the fine filament rayon at four times the rate that it can into the coarser rayon. But in actual practice two interfering factors come into play and make this assumption false.

The first factor is that the apparent color (that is, depth of shade) of a dyed rayon fiber is not simply dependent on the amount of dye present within it. If two rayon materials, one consisting of fine filaments and the other of coarse filaments, be dyed so that they each absorb the same amount of dye then it will be observed that the fabric made with fine filaments appears paler than the other. This fact is connected with another fact—that the depth of shade of a dyed fiber is proportional to the thickness of colored fiber substance through which the reflected or transmitted light has to pass. Thus the dyer is in general called upon to apply more dye to fine filament rayon materials. This counterbalances to a considerable extent the conclusion reached theoretically that fine filament rayon materials must dye very rapidly.

In the case of viscose rayon it is possible to construct a nomogram so that the dyer can, already knowing the amount of dye he has applied to secure a given shade on one type of rayon material, rapidly read off the amount he must apply to produce the same depth of shade on another material containing a different but known filament fineness. But the use of this nomogram gives accurate results only when employed in dealing with rayons similarly made without a stretch process.

Stretching Means Lower Affinity

The second factor is that in stretching a rayon filament so as to make it permanently thinner the fine structure is changed so that the fiber substance then has a lower affinity for most dyes. This can be clearly shown by a simple experiment. If a length of viscose rayon yarn be cut into two portions and these be then dyed together in the same dyebath with a direct cotton dye such as Chlorazol Sky Blue FF under conditions such that one length is held slack whilst the other is maintained taut, then after rinsing and drying slack so that they both dry to the same original length, it is found that the slack dyed length of yarn is deeper in shade than the other. In this experiment, care must be taken to use a yarn free from twist and to arrange that the individual filaments are kept spaced from one another so as to avoid disturbing effects normal with close filament packing.

Now if the stretching is carried out in the early stages of rayon manufacture and this stretched condition is set, then the reduced affinity for dyes is set at the same time.

This lower affinity of stretched rayons for dyes applies to most types of rayon, including the so-called synthetic fibers of which nylon and Vinyon are examples. But it is possible for the conditions of coagulating the filaments in spinning to be adjusted so that the reduced dyeing affinity produced by stretching is counterbalanced by other chemical or physical modification of the filament substance.

Courtauld Experiments

It may be remembered that Messrs. Courtaulds are making a number of different types of stretched viscose rayon, some only in the experimental stage. It has been recorded by Rose (*J. Soc. Dyers and Col.*, 1945, *61*, 115) that of these new types Durafil is made by spinning viscose into sulfuric acid of parchmentizing strength (around 65 per cent) and stretching at least 100 per cent followed by a rapid quench in water. Textile and tire Tenasco rayons are also made by the stretch spinning of viscose, but in this case the freshly coagulated rayon filaments are run through a water bath at about 90° C. immediately previous to stretching. Although both types of Tenasco are made with the aid of stretching it is interesting to note that one type has a higher affinity and the other a lower affinity for direct cotton dyes. But the Durafil rayon is difficult to dye; it requires about four times as much dye as does ordinary viscose rayon to produce a given depth of shade. Durafil is also unique in having a slower rate of dyeing than ordinary and Tenasco viscose rayons.

Rose has further noted that whilst good shades can be secured on Durafil by means of the slow-dyeing direct cotton dyes Chrysophenine G and Icyl Blue, it is not possible to produce ordinarily a deep shade with Chlorazol Fast Orange AG. Sulfur dyes give thin shades on Durafil and are thus in contrast to the vat dyes which are perhaps more serviceable than the direct cotton dyes for securing deep shades. Azoic dyes give a good deep dyeing if a naphthol is used which has a high substantivity for cellulose. It should be remarked, however, that the dyeing of Durafil with vat dyes is expensive since at least 50 per cent more than the usual amount of dye is required to produce a given depth of shade.

Fortisan, made by Messrs. British Celanese Ltd., is another type of fine filament rayon which is made by a stretch process. As at present being made it has a filament denier of 0.4 and is produced by stretching and saponifying acetate rayon. Thus it is usually dyed by means of those colors employed for cotton and viscose rayon. But here again the stretching has produced a lowered affinity for most dyes, especially those of the direct cotton class. It has about 50 per cent of the affinity for these dyes possessed by cotton. To secure deep shades it is necessary to use a limited number of selected dyes. However, the insoluble azoic dyes give bright full shades.

Vinyon yarns are cold-drawn about 300 per cent as a normal part of their manu-

facture in order to give them satisfactory strength and extensibility properties. In addition, this type of rayon is thermoplastic and so dyeing at temperatures higher than 65° C. may allow contraction to take place to an excessive degree. This stretching reduces the extent to which Vinyon will absorb dyes and so makes desirable the presence in the dyebath of an organic substance, such as dibutyl phthalate, to swell the fibers and make them receptive to dyes.

Problem of Filament Breakage

So far we have discussed the influence of stretching mainly as it affects dye absorption. But there is another point to be noticed. In the case of the fine filament stretched rayons it is found that these tend to break during the dyeing operation if they are repeatedly bent or flexed. Such straining of the fibers takes place, for instance, when fabric is drawn over a roller or guiding bar. Breakage also occurs when the surface of the fabric is rubbed against another surface, especially if this latter surface is rough. It seems that the fine filaments have not the same degree of toughness as is possessed by coarser filaments.

As a result of filament breakage in this way the fabric being dyed can develop a surface hairiness. Dyers of cuprammonium rayon materials noticed this in earlier days. Now that other types of fine filament rayon are coming into use (cuprammonium rayon has a filament denier of 1.3 but there is another type of around 0.5) this problem of filament breakage has to receive more attention. To prevent breakage it is necessary to avoid friction and undue tugging of the fabric whilst it is being dyed; also the time of dyeing should be kept to the minimum. Once the fabric has developed a surface hairiness it is impossible to correct this.

It is obvious that as a result of these new rayon developments involving the use of fine filament yarns made by stretch processes the dyer must be aware of their special properties — greater readiness to break under flexing and rough usage, a lower affinity for dyes in most cases, and the need for a greater amount of dye to produce a given depth of shade. Since dyes usually have individual characteristics some help in this matter can be obtained by the proper selection of the dyes to be used.

• PATENT DIGEST •

Paul Wengraf

NON-FELTING WOOL — A 2, 04

U. S. Patent 2,401,479 (Total Broadburst Lee Co., Hall-Wood, June 4, 1946

It is well known that wool is, by far, more damaged by medium concentrated than by highly concentrated alkalies. According to a shrinkproofing method, wool fabrics were heated during the last war for a restricted time and under certain conditions with alkalies whereby they were found to lose their felting properties. The new method protected by this patent consists of treating wool material at a temperature below 60°C with a caustic alkali, dissolved in a monohydric alcohol (butylalcohol, methylated spirit), an aromatic alcohol (benzylalcohol), an ether of ethylene glycol (Cellosolve) and the like. The fabric is immersed for about an hour in this solution, acidulated, rinsed and dried. The amount of water present in the reagent must be lower than 15 per cent. On drastic washing the sample shrunk in one case only 7 per cent in area compared with 34 per cent for the untreated fabric.

Earlier work done: The same company obtained in 1941 the B. P. 538,428, disclosing quite generally a shrinkproofing method by using similar alkaline solutions in alcohols, etc. The problem for rendering wool shrinkproof has been approached also by quite other means: B. P. 539,057 (Speakman et al.) recommends sulfide-or polysulfide treatments. Chlorine treatments are mentioned, *for instance*, sulfurylchloride in an organic solvent (B. P. 464,503; Hall, Hicking and Pentecost) or slightly alkaline hypochlorite solutions in presence of excess of CO_2 (B. P. 557,600 (Clayton & Edwards). Chlorine distributed in an organic solvent (B. P. 566,872, Wolsey Ltd.) B. P. 546,529 (Bleacher's Association) proposed also organic solutions of concentrated alkalies. Most recently good results have been obtained by using resin impregnations for instance with the Monomel or Lanaset Resins of Am. Cyanamid Co.

DELUSTERING OF VISCOSE, OBTAINED BY DRY SPINNING — F, 3, 01

Swiss Patent 240,201 (Bata A. G., Zlin, April 1, 1946)

Delustering of viscose in the spinning mass has been attempted by incorporating titanium dioxide or various organic insoluble substances within the spinning mass. The titanium method does not work in dry spinning viscose where the filaments are not subjected to a wet precipitating treatment. The threads are coagulated in drying chambers. It has been observed that in this case delustering can best be carried out by adding some high melting waxes, combined with some calcium carbonate.

Earlier work done in this field: Some years ago many water insoluble substances had been proposed for delustering the spinning masses. A few examples may be quoted: U. S. P. 1,958,949 (Enka), lanoline distributed in turpentine or in solvents; U. S. P. 1,981,643 (North Am. Rayon), calcium salts of thiocarbonic acid esters; U. S. P. 2,069,800-807 (du Pont), aromatic esters of polyvalent alcohols; U. S. P. 2,081,847-49 (North Amer. Rayon), chlorinated fats, oils and waxes; Ger. P.612,487 (Tomaszow), terpene hydrocarbons, etc., etc.

FLOCK PRINTING—FIBROUS CELLULOSE POWDERS — D, 2, 07

French Patents 864,099 and 864,100 (Heberlein & Co., April 17, 1941)

The patents relate to flock-printing processes. It has been observed that very interesting effects can be produced by pretreating fibrous material, transformed later on in a fine powder, with formaldehyde or esterifying or etherifying agents. The thus prepared flocks are blown over a pattern printed with a tacky varnish and adhere at these spots; the excess is removed by brushing as usual. The fabrics can thereafter be parchmentized with concentrated sulfuric acid, mercerized etc. and cross-dyed with direct dyes: the pre-treated flocks don't take up direct dyes. Various multi-color effects are possible, particularly in the special case of using a colored varnish as an adhesive for the flocks.

STARCH GLYCOLATE AS FINISHING SUBSTANCE — G, 2, 01

Swiss Patent 240,219 (F. Supf, April 1, 1946)

Starch can be transformed into ethers (analogous to the well known cellulose glycolates—trade name: Carboxymethocel —, now manufactured by Dow Chem. Co.) by treating it in alkaline solutions with chloroacetic acid. The product can be precipitated by alcohol but it was found that this precipitate cannot be worked up in a simple way; it is gelati-

nous and difficult to separate by filtration from the supernatant liquid. The present specification pretends to solve this problem by drying up the water-containing reaction's product on heated rollers; a very thin film is obtained which has to be comminuted and extracted with alcohol. Fine white scales, dissolving in cold water to a viscous liquid are obtained. The product can be used as a sizing agent or as an adhesive.

No references could be found concerning this novel starch derivative. It seems that the compound which is prepared according to the same method as the cellulose-glycolic acid has not found any use up to now. Most of the reactions to which cellulose is subjected can also be applied with slightly changed conditions to starch products.

VAT PRINTING—ORGANIC PHOSPHATES ADDED TO THE PASTES D, 2, 01

French P. 863,256 (I. G. Farbenindustrie A. G.)

Vat dyestuffs (also other categories of dyestuffs such as acid and direct dyes) give a far better yield in printing if difficultly soluble esters of aliphatic or aromatic hydrocarbons are added. The patent mentions tributylphosphate, triphenylphosphate and other similar agents. An example gives a formula for printing hexa-brom-indigo thickened by starch-British gum. The paste contains besides the necessary potassium carbonate and formaldehyde-sulfoxylate some tri-isobutylphosphate. The prints are said to become deeper and more uniform.

References concerning organic esters of phosphoric acid: Parallel compounds to the alkylsulfates of the Gardinol-type have been tried and recommended some times but apparently these substances had not the same good results as the alkylsulfates. Esters of phosphorous acid are mentioned in Ger.P. 646,480 (I.G., Daimler) and higher esters of phosphinic acid in Ger.P. 646,290 (Boehme-Fettchemie) as dispersing and wetting agents. In the present case however water-insoluble esters (in contradistinction to the water-soluble alkali salts) have to be used. The chemical reaction, occurring in this method, is not disclosed.

WATER REPELLENT FINISHES—WAX AND ALUMINUM SALTS G, 2, 02

French Patent 864,640 (Chem. Fabrik Pfersee, May 1, 1941)

Water resistant finishes of the "Impregnole" type, consisting of wax or paraffin emulsions, aluminum salts and protective colloids are well known. The present invention discloses a similar composition which however does not contain any protective matter but only the dispersed substance and the aluminum salt. According to the specification it is just a matter of finding the right proportions of the ingredients. If for instance a melted wax, having an acid number of 19 is incorporated in a basic solution of aluminum formate containing 20 per cent Al_2O_3 a stable emulsion can be formed, provided that the wax has a very low acidity. An example discloses the following proportions: 20 kg. basic aluminum formate, containing 20 per cent Al_2O_3 and 28 per cent HCOOH are diluted in a centrifuge with 40 l. hot water, 10 kg. wax (acid-number 19, Sapon. Nr. 21, OH-index 85) are stirred in; a fine emulsion, stable after dilution, is obtained.

COMPOSITION FOR TREATING BOILER WATER H, 6

U. S. Patent 2,400,543 (Dearborn Chem. Co.-Denman, May 21, 1946)

Waters containing ingredients which might induce foaming are treated with aliphatic amines, having chains over 6 C-atoms. Examples are undecylamine, laurylamine, pentadecylamine and the like. Particularly good results are obtained when waters, having some potassium or sodium alkalinity are treated. It is probable that oils, used sometimes for alkaline waters form soaps, whereby strong foaming reactions are observed as a great disadvantage. These (insoluble) amines, mentioned above are added in the form of a dispersion. *Tannin is preferred* as a dispersing agent in alkaline water, having by itself a foam depressing effect.

The same company obtained recently a patent protecting the use of colloidal substances such as colloidal silicic acid or colloidal chromium hydroxide (U. S. P. 2,391,895), of high quaternary compounds tetracatylammonium bromide (U. S. P. 2,366,727) and of higher ketones (U. S. P., 2,363,921-94) for defoaming boiler water. U. S. P. 2,375,007 (Shell Developm.) discloses the foam preventing action of organic silicon compounds, B. P. 568,318 and 568,510 (Imp. Chem. Ind.) the action of high substituted amides and amines.

LUBRICATING RAYON YARNS—MINERAL OIL DISPERSIONS A, 2, 07

U. S. Patent 2,401,240 (Industrial Rayon Corpor., Mac Laurin, July 16, 1946)

Lubricating of yarns, particularly of rayon threads before coning, knitting or weaving is generally carried out by using pure mineral oil. It has been found however that cones of threads, lubricated with mineral oil tend to bulge out of the shape. Thus the present invention suggests to add an oil-soluble ester of a polyhydric alcohol, for instance sorbitan-tri-oleate which is by itself oil-soluble. The yarns do not exhibit an appreciable friction and they are well suited for the subsequent processes. When instead of the tri-oleate the mono-oleate is used and subjected to an alkylating reaction with ethylene oxide a product is formed which is not only soluble in mineral oil but also dispersible in water.

Earlier work done in lubricating mixtures with mineral oil: according to U. S. P. 2,388,826 (Eastman Kodak) higher nitriles are added to mineral oil; according to U. S. P. 2,387,510 (du Pont) mineral oil sulfonates. U. S. P. 2,385,423 (Celanese) recommends a mixture of mineral oil, sulfonated olive oil and diamylphenol, U. S. P. 2,344,671 (Amer. Hyalsol) higher alcohols and U. S. P. 2,176,402 (Enka-Koch) a mixture of mineral oil and butyl stearate.

PECTINS AS DETERGENTS E, 5

Ger. P. 748,449 (Chemopharm, Beyer, July 21, 1944)

Pectins are known to have a certain washing effect which is however not sufficient for domestic and technical purposes. It has been found that *partially degraded pectins*, being waste products of the fruit canning industry, also pectins, obtained from carrots, are valuable auxiliary products when added to alkylnaphthyl-sulfonates. The pectins which have to be used have a molecular weight of 900-1,000 while undegraded pectins (high molecular pectins) contain pectic acids of 1,100-1,350 mol. w.

Pectin has been proposed for thickening purposes: U. S. P. 2,392,854 (Mutual Citrus Products). It is advisable to add small quantities of Al_2O_3.

DETERGENTS FROM PROTEIN DEGRADATION PRODUCTS E, 4

U. S. Patent 2,398,317 (Montclair Research Corp., MacKenzie-Spialter, April 9, 1946)

Detergents are formed from degradation products of proteins, for instance from zein (the alcohol-soluble protein, obtained from maize), soya bean meal, egg albumen and the like. The degradation is carried out by warming the products with alkaline solutions. The degraded substances are reacted with acid chlorides such as chloroacetylchloride and dried under reduced pressure after having been carefully neutralized. A water insoluble resin is produced which is solubilized again by reflexing it with a tertiary amine, for instance, pyridine. A quaternary am-

monium compound is formed, having good detergent and wetting properties.

Earlier work done in this field: The auxiliary agents, known under the name of "Lamepons" are prepared from protein degradation products reacted with higher fatty acid or other organic acid chlorides. The patents have been granted to the German Company Landshoff & Meyer, Gruenau, and one of the first patents in this series was B. P. 413,016. Zschimmer & Schwarz obtained protection for a similar product by reacting protein degradation products with halogen substituted organic acids—thus the halogen linked to another part of the chain (Ger. P. 735,010 from 1942). Chem. Fabrik Gruenau proposed further, according to Ger. P. 728,224, an aftertreatment of the protein degradation product fatty acid condensates with alkylene (ethylene) oxide.

ACID DYES—IMPROVEMENT OF WASH FASTNESS C, 4, 06

Ger. P. 748,450 (Anonym., January 12, 1945)

Natural or synthetic protein fibers are dyed for the most part with acid (levelling) dyes which have the drawback of a poor resistance to washing agents. The solidity of these acid dyes (examples: Alizarin Cyanin Green G, Amidonaphtol Red 2 B, Orange II) can substantially be improved by aftertreating the dyeings with methylating agents. The methylation is carried out by warming the yarns or fabrics in a closed vessel up to 60-70° C with methanol and adding a catalyst such as sulfuric acid or potassium bichromate as a waterbinding agent.

Earlier references: French Patents 800,570 and 800,582 (Aceta) propose to improve the solidity of acid dyed wools by an aftertreatment with alkylene oxides (thus a more efficient alkylating agent). The treated fibers are said to be also moth resistant. Blackburn and co-workers investigated the properties of alkylated wool and proteins in general in "Biochem. Journal" 1944, pages 25 and 171. It has been found that the wool becomes more resistant to extension and that the COOH-groups, contained in the wool molecule, are esterified to a high degree.

PROTEIN DEGRADATION PRODUCTS—"LAMEPONS" AFTERTREATED E, 5

Ger. P. 748,564 (Chem. Fabrik Gruenau, Geiler-Wiegand, November 6, 1944)

The degradation products of proteins can be combined with high fatty acids or rosin acids to give washing agents. These products, known as "Lamepons" (compare with the abstract to U. S. P. 2,398,317) are not sufficiently soluble in an acid medium. The inventors observed that an acid reacting washing agent can be prepared by dissolving a condensate of the type as mentioned above (Lauric "lysalbinate") together with alkylnaphthalene sulfonic acid salts ("Nekal"-type). The mixture is an oil, dispersible in water. It can be used at a pH of 4.9, also for washing hairs, skins or the like.

CELLULOSE GLYCOLATES FOR LUBRICATING WOOL A, 2, 02

Ger. P. 748,632 (A. Th. Boehme-Schrodt November 7, 1944)

(Compare with abstract to Swiss Pat. 240,201—G 2, 01. Fatty or oily products for *lubricating wool* have the drawback to be difficultly dispersible in water. The inventor proposes to substitute these fatty substances by cellulose glycollic acid salts (sodium cellulose glycolate) which is known to be stable in storage. It has been observed that the spinning process is facilitated by these new lubricating agents. According to Ger. P. 748,755 the glycolates can also be used as fulling agents. Ger. P. 748,754 (I. G. Farbenind., Nuesslein-Pauser, December 1, 1944) recommends the same glycollic acid salts for different washing purposes. The inventors claim that this effect can still be improved by adding some peroxide. *References:* Mixtures of polyalcohols and cellulose glycollic acid salts are recommended for textile auxiliary purposes in U.S.P. 2,350,782 (Lietz); this patent as well as U.S.P. 2,335,194—1943 (I. G. Farben-Nuesslein-Pauser) being identical with Ger. P. 748,754 (mentioned above) are vested in the Alien Property Custodian. Cellulose glycollic acid salts are widely used also for finishing purposes. Tradenames for the products are "Carboxymethocel" and "Collocel". Manufactured by Dow Chemical Co., in form of sodium salts (brand "S") and of aluminum salts (brand "A").

LUBRICANTS FOR WOOL—AMINE SALTS A, 2, 02

Ger. P. 748,836 (I. G. Farbenindustrie A. G,. Haussmann et al., November 11, 1944)

Lubricating compositions for wool consist according to one of the typical examples of 15 per cent of an amine salt (cyclohexylamine salt of a higher sulfonic acid), a synthetic hydrocarbon mixture made by the so-called Fischer-Tropsch-Synthesis and a mineral oil. The cyclohexylamine salt has the essential effect (superior to a simple ammonium salt) to remove later on almost the entire lubricant, adhering to the wool.

Earlier work done in this field: Fatty amines and amides have been proposed as additional products to mineral oil lubricants. Compare: U.S.P. 2,340,881 (National Oil Products): higher fatty acid amides, emulsified; U.S.P. 2,336,700 (du Pont) naphthenic acid amides; U. S. P. 2,198,001 (Eastman Kodak) organic amine salts etc.

PIGMENT DYEING (AND PRINTING) WITH VAT DYES C, 4, 02

Ger. P. 748,974 (Stockhausen, November 14, 1944)

The pigment padding process, fully described in AM. DYEST. REPORTER, 1945 page P 206, consists of padding first with a vat dyestuff dispersion and treating the fabric in a second bath, containing an alkali and a reducing agent. Alkaline hydrosulfite solutions which were not sufficiently stable have often been replaced by Formaldehyde-sulfoxylate plus alkali carbonate. The inventor found that the carbonate of the developing bath can favorably be replaced by caustic alkali in an excess of 10 g. per L.

The first attempts to fix vat dyestuffs in printing first the non reduced pigments and then developing the prints in a second, reducing bath, have been made by the "Colloresin" method, described in U. S. P. 1,922,978 (Pfeffer). The inventor used methylcellulose thickeners which hardened by passing through the second (alkaline reducing) bath. The same inventor constructed also a special developing apparatus for the pigment vat prints, fixed in the "Colloresin" process (Ger. P. 574,939).

"ANIMALIZING" OF CELLULOSE YARNS—CYANAMIDE RESINS C, 4, 06

Ger. P. 749, 051 (Courtaulds Lim., Tallis, January 15, 1945)

By numerous publications originated in the laboratories of the Calico Printers Association it has been disclosed that urea-formaldehyde condensates are able to increase under certain conditions the affinity of acid dyestuffs to cellulosic fibers. This method has been used for various purposes in the printing and dyeing field. The present invention (identical with B. P. 506,793) states that also a pre-treatment of cellulosic material with cyanamide-formaldehyde condensates has the same effect. A cyanamide solution is neutralized and formaldehyde and ammonium thiocyanate are added. After drying and curing, the fibers can be dyed in deep shades with Azogeranine 2 GS or Sulfoncyanin GR ex.)

Some earlier references: U. S. P. 2,375,124 (same company) suggests to pre-treat

the fibers with a condensate of diphenylguanidine and formaldehyde; U. S. P. 2,093,651—1937 (Wiedmer-Pierce); pretreatment with urea-formaldehyde etc.

ZINCATE—CELLULOSE—SOLUTIONS FOR PERMANENT FINISHES G, 2, 01

Ger. P. 749, 082 (Anon.—November, 1944)

During the last war solutions of cellulose in sodium zincate have been used for different textile purposes, for instance for permanent finishes, for mosquito nets, etc. (see below). The way to make a uniform solution of cellulose in sodium zincate described in the present patent differs but slightly from the method, widely used in the U. S.: Cellulose is mixed in a homogenizing machine with about six times its weight of a caustic zinc solution, containing 27 per cent NaOH and 9 per cent ZnO. The mass is kept for some days at room temperature; thereupon about double the quantity of water is added whereby an approximately 5 per cent cellulose-solution results.

Earlier work, done in this field: the first U. S. P. 2,322,427—1943 (Edelstein) covered the method for preparing "Kopan" solutions. Later on some patents, granted to the same inventor, described some improvements over the first process. According to the first mentioned patent a concentrated sodium zincate solution is prepared and cooled with chopped ice to a minimum of 15° C. Pre-wetted cellulose is stirred in and after some time a homogenous dispersion of the cellulose is formed, which can be diluted with water to impregnate textiles. The finish is permanent when insolubilized with one of the usual precipitating agents such as organic acids and the like.

ENGRAVING OF COPPER ROLLERS D, 6

Ger. P. 749,151 (Anonym.—November 20, 1944)

Etching of copper plates and rollers for engraving purposes is very often carried out with nitric acid. Whether the protecting layer, covering the non-engraved areas, is prepared by hardened photographic films or by acid resistant lacquers it happens very often that the acid attacks this protecting compositions. It has been found that by adding alum to the nitric acid the resistance of the lacquer was considerably increased. The formula for the etching solution was: 150 p.water, 120 p.postassium alum and 150 p.nitric acid.

Reference: U. S. P. 2,000,576 (Boller, Grasselli) mentions that working with nitric as an etching agent has often irregular results. An addition of some ammonium sulfate to the nitric acid is suggested as a remedy.

DYEING MIXED WOOL-COTTON FABRICS—PEPTIDES AS PROTECTIVE AGENTS C, 4, 01

Ger. Pat. 749,387 (Gerstner, November 28, 1944)

An addition of so-called synthetic peptides, obtained by the acid hydrolysis of different proteins, is recommended for avoiding the disadvantage of fading in dyeing direct dyestuffs in mixed fabrics. The phenomenon verbally denoted as "injury by boiling" (Germ. expression "Verkochen") may or may not be caused by a reducing action of the wool fibers. The peptides to be applied in this process are mentioned in a literature reference (Skraup, Monatshefte 1908, p. 455): gelatine from bones or fish-glue are treated for some hours in a H_2SO_4-solution at about 50° C. and neutralized. (Small amounts of oxydizing agents, added to the dyebath are said to prevent this fading process too).

PIGMENT PRINTING PASTES—POLYVINYL DERIVATIVES D, 2, 07

Ger. Pat. 749,390 (I. G. Farbenindustrie A. G., Nuesslein-Monheim, January 11, 1945)

A pigment printing method consists of applying a paste, containing polyvinylalcohol and aldehyde and the pigment, to a textile material and drying it without any other fixing operation. Only in certain cases, according to the nature of the dyestuff, a supplementary treatment might be required. An example discloses a formula for a printing paste, containing lamp black as a pigment, polyvinyl alcohol, formaldehyde, hydrochloric acid as a catalyst and a special dispersing agent (a condensate of naphthalene sulfonic acid and formaldehyde). It seems to be a great technical advantage that drying on the air at moderate temperatures is sufficient to obtain prints solid to rubbing and to washing.

Earlier work done in this field: Water-soluble amorphous polymers of acrylic acid were already described in 1930 (U. S. P. 1,979,679—I. G. Farbenindustrie A. G.) as thickeners. The paste contained only about 5-7 per cent solids so that it seemed to be very suitable for pigment printing. Pigments consisting of metal powders are fixed by alcohol-soluble polyvinyl-derivatives according to B. P. 426,805 (I. G. Farbenindustrie A. G.) The viscous printing mass is applied to the fabrics by relief-printing rollers. These references *do not mention* the application of *condensates* of polyvinyl-compounds *with aldehydes.*

ALKALI RESISTANT LOCUST BEAN GUM-THICKENER D, 1

Ger. P. 749,708 (Kaestner, December 1, (1944)

Locust bean gum cannot be used as a thickening agent in vat dyestuff containing printing pastes because of its sensitivity to alkalies. It has therefore already been tried to apply the pasted vat dyestuff, dispersed in a locust bean thickener and to develop the print in a formaldehyde-sulfoxylate-alkali solution (analogous process to the "Colloresin" printing method). The results were poor. A modification of the locust bean gum, prepared by treating the material with acids according to the inventor's Ger. P. 578,776, was found to give deep and brilliant prints. This modified locust bean gum is obtained by boiling the raw material with water and the thus formed gel is treated with acids or diastatic substances. The viscosity decreases and heating is interrupted when the desired consistency is attained. This locust bean gum thickener, although compatible with alkaline compositions, is not to be used alone with the normal alkaline vat dyestuff paste: the printing paste consists of the thickener and the vat dyestuff only. After drying the printed fabric is impregnated with a solution of potassium carbonate and formaldehyde sulfoxylate, aged and finished as usual.

Former references: Ger. P. 611,967 (Tres): the locust bean gum is treated with alkali fluosilicates. It is claimed that very stable thickening pastes are obtained but the alkali resistance is not mentioned. The Company Neogum obtained the French Pat. 755,961 for a locust bean treating method: the material had to be exposed to the influence of an acid until the surface became somewhat cracked, thereupon the acid was removed and the surface parts separated from the proper gum by a treatment with an organic liquid such as alcohol or ketone.

BLEACHING SPUN RAYON FABRICS—Ca-HYPOCHLORITE B, 1

Ger. P. 749,804 (Ulrich, January 27, 1945)

The inventor proposes to use a mixture of suspended lime particles together with sodium hypochlorite instead of pure hypochlorite. The idea is to pre-scour cellulose material and particularly spun rayon or spun rayon mixed with cotton threads under the mildest possible conditions. The method is carried out in the following way: the goods are placed in a kier and boiled with a calcium hydroxide solution. After some hours this solution is removed and the goods are rinsed with cold water. Insoluble Ca-compounds and adherent particles remain within and between the fibers. Thereupon a warm sodium hypo-

chlorite solution is poured over the textiles which are eventually acidulated and aftertreated with a warm sodium carbonate solution. The goods which are otherwise sensitive to pure caustic alkalies are well preserved by this treatment which reminds one in its principal idea of the old lime-soda bleaching process. About 15 years ago the Austrian Patent 121,528 (Ullmann) described a method for prescouring textile goods with a composition of caustic alkalies and metal hydroxides with the effect of improving the scouring action in bleaching kiers. It was disclosed in this specification that the superior effect resulted from the property of non-alkaline hydroxides (for instance lime or alumina) to remove impurities of a fatty character while the non-fatty substances are extracted by the alkaline boiling operation.

PRINTING ROLLER, FORMED FROM AN INNER CORE AND A COPPER SURFACE LAYER D, 6

Ger. P. 749,802 (Anon., December 8, 1944)

Printing rollers for textile use were mostly made in former times from pure copper. The scarcity of raw materials forced the German industry to look for substitutes. Some suggestions had been made already in former years (see below) to use electrolytically deposited metals (zinc) fixed on the surface of a metal cylinder and to compound a thin layer of copper where the pattern had to be engraved. The zinc layer was intended to compound the thin copper layer with the inner cylindrical core. The present invention claims to have solved the problem of attaining a firm connection between the outside copper layer and the metal cylinder: the latter has to consist of a zinc alloy, blended with small amounts of Al, Mg and 0.7-1 per cent copper. A copper layer electrolytically deposited on this cylinder adheres firmly to the inner cylinder, forming the core. *Former reference:* B. P. 445,321 (Standard Proc. Corp.) describes a printing roller consisting of a hollow iron cylinder covered by a thin surrounding layer of copper.

Division of Cellulose Chemistry

American Chemical Society

Abstracts of Some of the Papers Presented at Chicago, Ill., September 9 to 13, 1946

The Acetylation of Cellulose in Phosphoric Acid Solution

Emil Heuser, William Shockley, and Alberta Adams, Institute of Paper Chemistry, Appleton, Wis.

In contrast to the use of fibrous cellulosic materials, partial acetylation of cellulose in solution may be expected to proceed in a more homogeneous manner and to result in a more uniform distribution of the acetyl groups over all chain molecules. Strong phosphoric acid may be used as a solvent for cellulose, and acetylation may be carried out by adding acetic anhydride and allowing the solution to stand for a certain length of time.

During the dissolving step, the cellulose is degraded, essentially depending upon temperature and time. Further but somewhat less degradation occurs during the acetylation step, again essentially depending upon these two variables.

Using an 85 per cent phosphoric acid as the cellulose solvent, the highest acetyl content obtainable was about 17 per cent. Obviously, the water present in the 85 per cent phosphoric acid counteracts the substitution reaction and arrests the acetyl content at this low level. With a 100 per cent phosphoric acid, acetyl contents were obtained which were only a few per cent below that of the triacetate, and the time required was remarkably short—i.e., 30 to 40 minutes. The highest acetyl content achieved thus far was about 42 per cent. Obviously, the moisture which is rapidly absorbed by the strong phosphoric acid from the surrounding atmosphere sufficed to prevent full substitution. Undoubtedly, the triacetate value would be reached by eliminating this moisture absorption.

Depending upon the choice of the starting cellulosic material and upon conditions of dissolving and acetylation, the degrees of polymerization of the acetates obtained ranged between 530 and 100 (according to the Staudinger method).

Densities of Cellulose Esters

Carl J. Malm, Leo B. Genung, and John V. Fleckenstein, Eastman Kodak Co., Rochester, N. Y.

Densities of cellulose, cellulose acetates, acetate propionates, and acetate butyrates have been measured by the Archimedes and flotation methods. They have also been calculated from unit molecular weights and unit molecular volumes based on the densities of regenerated cellulose and the various acids. Observed and calculated results agree within two units in the second decimal place.

Regenerated cellulose samples were found to have a density of about 1.52. The densities of other cellulose samples varied, depending upon their origin and degree of purity. Observed cellulose ester densities varied with composition, reaching values as low as about 1.28 for the triacetate and 1.17 for the tributyrate.

The Archimedes method is preferred for film samples, but the flotation method is very useful for powders and fibrous samples.

In the measurement of densities it is necessary to select immersing media which do not dissolve or swell the sample. Water or aqueous cadmium sulfate solutions were used for esters of high propionyl or butyryl content, and carbon tetrachloride or mixtures of carbon tetrachloride and benzene or tetrabromoethane and xylene were used for cellulose acetates and mixed esters of low propionyl or butyryl content.

Calculated approximate values are also presented for simple fatty acid esters from formate to stearate.

Composition of Rosin Size Precipitate—Occurrence of Alumina

D. Price, Hercules Experiment Station, Hercules Powder Co., Wilmington 99, Del.

A method for determining alumina in wet rosin size precipitate floc has been developed and applied. Its use showed that a standardized size precipitate contained no appreciable amount of alumina; this demonstrated that the aluminum ion, rather than alumina, was necessary for the

formation of an effective rosin size precipitate. It was also shown that any excess alkali introduced into the paper-making system reacted with alum to form alumina which coprecipitated with the rosin size.

A Calorimetric Investigation of Moisture in Textile Fibers

Frank C. Magnee, H. J. Portas, and Helmut Wakeham, Southern Regional Research Laboratory, New Orleans, La.

Application of the heat of fusion, or calorimetric, method to the evaluation of free and bound water in textile fibers is described. Measurements are reported on native and mercerized cottons, rayon, nylon, and glass fibers. It is shown that the method permits differentiation between water absorbed by active groups in the fiber material and water of capillary condensation.

The initial 4.3 per cent water (dry basis) adsorbed by a dry native Acala cotton is all nonfreezing water and is believed to be taken up by the free hydroxyl groups in the amorphous regions of the fiber. Water adsorbed in excess of 4.3 per cent is interpreted as being water of capillary condensation in the pore spaces of the fiber. Part of this water freezes and exhibits heat of fusion, and part does not. The non-freezing fraction decreases as the freezing temperature is lowered and the water is therefore believed to fill capillaries in which its activity and freezing point is reduced. Similar interpretations are made of the results obtained with mercerized cotton and rayon fibers.

Fractions of amorphous or accessible cellulose are calculated on the basis of this interpretation, and the values so obtained are found to agree fairly well with those estimated by other methods. Calculations of the maximum capillary radii for those pores filled with non-freezing water and of the volume of water in such capillaries are also reported.

A Comparison of Elastic Properties of Some Tire Cords

Edith Honold and Helmut Wakeham, Southern Regional Research Laboratory, New Orleans, La.

The method of determining hysteresis, elastic modulus, total growth, and growth rate of tire cords under conditions of rapid cyclic loading is reviewed. Measurements of these properties are reported for cotton, mercerized cotton, rayon, and nylon tire cords at three conditions of moisture content and temperature: (I) 25°C. and dry cords; (II) 25°C. and 40 per cent relative humidity; and (III) 75°C. and the same moisture values as those of condition II.

In general, the stretched cotton cords and the mercerized cords have elastic properties which are relatively unaffected by changes in temperature and moisture contents from one condition to the other. The unstretched cotton, rayon, and nylon cords, on the other hand, show appreciable changes as moisture is added to the dry cord. These changes are accentuated as the temperature is raised. One outstanding difference is noted when the elastic moduli of the cotton and mercerized cords are compared with those of the rayon and nylon cords at the various conditions: the moduli of the cottons remain steady or increase with moisture and temperature, whereas the moduli of the rayons and the nylon decrease with increasing moisture and temperature.

Some possible significances of these factors in tire performance are discussed.

Electron Microscopical Studies of Natural Cellulose Fibers

William G. Kinsinger and Charles W. Hock, Hercules Experiment Station, Hercules Powder Co., Wilmington 99, Del.

Three recent developments in the technique of preparing specimens for electron microscopy—metallic shadow-casting, surface replicas, and electron stains—have been applied to a study of the submicroscopic structure of natural cellulose fibers. By means of metallic shadow-casting, beaten fibers were found to consist of fibrils whose diameters varied from 90 to 400 Å., depending on the sample. These fibrils were frequently found in sheets whose thickness corresponds to the thickness of growth rings in the fiber. By the use of thin film replicas of the surface of unbeaten fibers it has been demonstrated that such fibrils exist in the original fiber.

A periodic structure at 150 Å. along the fibril axis has been detected in specimens prepared by metallic shadow-casting and in specimens stained with lead acetate. The significance of this spacing or its relation to the crystalline structure of the fibril is not yet known.

TRADE NOTES • NEW PRODUCTS

• PABST RESEARCH

The Pabst Brewing Company has announced an expanded program of research under the direction of Dr. Alexander Frieden, who recently joined the organization.

A research building is now under construction at Milwaukee. It consists of three stories, each of about 9,000 square feet. The first floor is for offices and pilot plant. The second floor will house the Theoretical Laboratories and the third floor the Applied Laboratories. The present groups consisting of the Bacteriological Laboratory headed by Dr. J. C. Hoogerheide, the Biochemical Laboratory headed by Dr. Harold Levine, the Physical Chemistry Laboratory headed by Dr. W. D. Claus, the Organic Chemistry Laboratory headed by Dr. S. A. Morell and the Chemical Engineering Laboratory headed by P. Deren will be enlarged and the work expanded.

In addition to the above, it is contemplated to set up a laboratory on fundamental studies of flours and starches.

The Applied Laboratories will have units on textiles, paper, adhesives and food. These laboratories will work on the application of the products the company is now manufacturing and those it develops for textile mills, paper mills, for the manufacture of adhesives and in the food industry.

Personnel for the new positions is now being selected by Dr. Frieden.

• INFORMATION CLEARING HOUSE

A library research service of special interest to industrial and scientific organizations not having ready access to the wealth of scientific literature in New York City is now offered by the Technical Library Consultants, 347 Madison Avenue. The service is specifically designed to meet the literature research needs of executive, sales and research departments.

Specialists on the staff have been serving industry for years in the installation of complete special libraries, technical indexing of organization reports and finding the answer to all research problems so far as the literature and patents in most European languages can supply it.

• F. W. SMITHER RETIRES

Frederick W. Smither, chemist at the National Bureau of Standards since 1914 and authority on the analysis of soaps and other detergents, retired on August 31 after 39 years of continuous Government service, it was announced recently by Dr. E. U. Condon, Director of the Bureau. Mr. Smither has been chief of the Section on Detergents and Miscellaneous Materials

for 22 years, and from 1917 to 1924 was chief of the Section on Platinum Metals and Chemical Reagents, both of which are in the Chemistry Division.

Mr. Smither has served on committees for the analysis of soap and other detergents of the American Chemical Society, as Chairman since 1937; of the American Society for Testing Materials, as vice-chairman of Committee D-12 since the committee was organized in 1936; and of the American Oil Chemists Society (1926-1946). Mr. Smither was president of the Chemical Society of Washington in 1926, and is a fellow of the American Association for the Advancement of Science.

• NEW PLANT FOR RICHARD

Richard Finishing Co., Inc., with sales offices at 489 Fifth Avenue, New York City, announces it has purchased five acres and two large buildings at Jermyn, Pa., 12 miles north of Scranton, for a dyeing and finishing plant of circular knit goods of cotton, rayon and acetate. Operations will begin about October 1, 1946.

• STANDARDS SECRETARY RESIGNS

H. J. Wollner, Secretary-in-Charge of the New York office of the United Nations Standards Coordinating Committee, announced that he has submitted his resignation therefrom. In undertaking the job of organizing western hemispheric activities of the Committee in 1944, Mr. Wollner had an understanding with the Committee that he would stay with the organization until June 30, 1946, by which time it was hoped a new international standards body, permanent in character and competently established, would have been created.

It is anticipated that when all of the national bodies meet in London in October of this year, the new organization will have been launched.

Based on advice received by Mr. Wollner, but thus far not officially confirmed, the UNSCC will probably close the New York office and carry on all of the international work through its London office. That office now has in preparation plans for the fall international meeting, part of which will probably be devoted to a study of some of the standards projects which have thus far been proposed. It is anticipated that advice as to the program of this meeting will be issued by the London office.

• APPOINTED HOOKER WORKS MANAGER

The Hooker Electrochemical Company has appointed John D. Rue as Works manager of its Tacoma plant. Mr. Rue, a widely known authority on the use of chemicals in the manufacture and bleaching of pulp and paper, has been associated with the Hooker Company since 1931. Prior to that time, he was in charge of the Pulp and Paper Section of the U. S. Forest Products Laboratory at Madison, Wis. At the Hooker Niagara Falls plant, Mr. Rue was engaged in Sales Service, particularly for the pulp and paper industry. Since 1942, he has been associated with the Engineering Department as executive assistant to the chief engineer.

Mr. Rue brings to the Tacoma plant and the west coast, an intimate knowledge of both chemicals and engineering involved in the pulp and paper industry, as well as a broad experience in technical and chemical engineering service.

Kenneth H. Barnard, who has been appointed to head the Textile Resin Application Laboratory of American Cyanamid's Textile Resin Department, developers of Lanaset resin for wool shrinkage control, and other new textile finishes.

Mr. Barnard is an active member of many chemical and scientific organizations and has served the American Association of Textile Chemists and Colorists as Chairman of the Intersectional Contest and Chairman of the Standing Committee on Conventions and Programs.

During the war Mr. Barnard was the industry representative on the Tropical Deterioration Committee (Textiles) of the Office of Scientific Research and Development.

Before joining American Cyanamid Mr. Barnard was research director of the Cotton and Rayon Division of the Pacific Mills.

• R. & D. R. PAMPHLET

Riverside & Dan River Cotton Mills, Inc., are sending out to the industry a pamphlet entitled "Continuous Pigment Vat Dyeing."

This process was developed at Dan River during the war years and has subsequently been patented. At the present time Dan River Mills are prepared to grant licenses to other members of the industry.

The booklet describes the process briefly and also publishes the text of the patent and the text of the licensing agreement. Copies of this booklet may be obtained from the Research Engineering Division, Riverside & Dan River Cotton Mills, Inc., Danville, Va.

• N.A.C.M. MEETING POSTPONED

The annual meeting of the Association, originally scheduled for Thursday, October 3rd, has been postponed to Thursday, October 10th, and will be held at The Copley-Plaza, Boston, Mass.

This change is necessitated because of congested hotel conditions due to the start of the World Series.

• DRY-MOUNT

Dry-Mount, a new Abraser accessory that simplifies and speeds preparation of textile specimens for abrasion-resistance testing, has been made available for use in furthering product development and quality improvement programs of textile mill research laboratories, according to its manufacturers, Taber Instrument Corporation, 111 Adr Goundry St., No. Tonawanda, N. Y.

A double-coated adhesive sheet, this new abrasion-testing aid is designed to make insufficiently rigid fabrics adhere with tenacious, uniform "grippage" to metal or cardboard backing.

Eliminating the factor of any possible wrinkling, buckling, slipping or stretching of specimen during test, Dry-Mount is said to effectively expedite over-all wear-testing efficiency and assure more accurate results, the manufacturer reports.

Tacky surfaces of this improved specimen-preparation product, it is said, simply "anchor" a flexible fabric to the specimen plate while test is being performed and have no effect whatever on the test sample's physical properties.

• BURKART-SCHIER SOAP EXTENDER

Of timely interest to the textile industry is the development of a soap extender by Burkart-Schier Chemical Company of Chattanooga, Tenn. The cost of this new product—Burk-Schier XX-T—is less than that of soap, yet it is claimed, it may be substituted pound for pound for a considerable percentage of soap customarily used. Woolen and worsted mills report that superior results are obtainable with XX-T at an actual savings by replacing 3 ounces of soap in the fulling and scouring formula with 3 ounces of Burk-Schier XX-T, retaining the usual amount of soda

ash. The soap stock is said to have added detergency and is kept fluid. The problem of starting up with gelled or solid soap stock is said to be eliminated.

It is stated that, with the above formula, wetting is faster and dirt, soil and grease are readily removed and held in suspension for quick rinsing.

For scouring rayons and cottons XX-T may be applied successfully to yarns, hosiery, and piece goods. Burk-Schier XX-T and mild alkali are said to insure clean, well bottomed goods—ready for bleaching or for dyeing. It is claimed that XX-T has excellent wetting properties, and when used in the dye bath in place of soap, insures even penetration of dyestuff and clear bright colors in a minimum of time.

Burk-Schier XX-T is a versatile auxiliary and of special interest now in view of the shortage of soaps and other processing agents. XX-T is available in quantity and immediate deliveries can be made. Samples and further data upon request.

• WESTVACO PERSONNEL CHANGES

Effective October 1, John deF. Meyler, a member of the Sales Division, Westvaco Chlorine Products Corporation, New York, for over eleven years and presently Midwest Sales Division Manager at Chicago, returns to Westvaco's New York headquarters as Assistant Manager of Sales.

Simultaneously, W. G. Hodson becomes Resident Manager of Westvaco's Chicago Office covering the Wisconsin, Iowa, Northern Indiana, Minnesota, and Illinois territories.

As part of its long-term expansion program Westvaco also announces the assignment of John M. Richard as Resident Salesman in St. Louis with offices at Ninth and Gratiot Streets; Arthur F. Smith as Resident Salesman at Cleveland with offices at 3540 Groton Avenue S.E., and Preston F. Tinsley as Resident Salesman at Cincinnati with offices at the Second National Bank Building. Warehouse stocks of Westvaco Chemicals will henceforth be maintained at Detroit; Hammond, Indiana; St. Louis; Cleveland and Cincinnati.

• DISTRICT MANAGER, CARBIDE & CARBON

Bruce A. Gustin, Jr. has just been appointed district manager of the Charlotte Office of Carbide and Carbon Chemicals Corporation, a Unit of Union Carbide and Carbon Corporation, according to an announcement by Company officials. Mr. Gustin has been with the organization since 1937 and recently worked with the Manhattan Engineering District at the Oak Ridge atomic energy plant operated for the government by Carbide and Carbon Chemicals Corporation. He is now located at 116½ South Church Street, the new address of the Corporation's Charlotte office. Richard M. Joslin, Charlotte district manager for the past two years, is being transferred to the Detroit Office.

R. Norman Semler, who has joined the American Cyanamid Company as assistant to George C. Ramey, Advertising Manager and Director of Quality Control for Cyanamid's Textile Resin Department. Mr. Semler was associated with the Textile Sales Development of Owens-Corning Fiberglas Corporation.

●

THE
DECEMBER 2ND
ISSUE
OF THE
AMERICAN
DYESTUFF REPORTER
WILL
COMMEMORATE
THE
TWENTY-FIFTH
ANNIVERSARIES
OF THE
A. A. T. C. C.
AND THE
S. O. C. M. A.

●

• SYLVANIA DIVISION, AMERICAN VISCOSE

American Viscose Corporation's acquisition of the assets and business of Sylvania Industrial Corporation became effective on September 12th, according to a joint announcement by William C. Appleton, president, and Dr. Frank H. Reichel, chairman of the board. Sylvania will now be known as the Sylvania Division of American Viscose Corporation.

The transaction involved the transfer by Sylvania to Viscose of all its property, assets, business and good will, subject to liabilities, in exchange for 327,411 shares of common stock of Viscose, equivalent to three-fourths of a share of Viscose for each one share of Sylvania after the declaration by Sylvania of a five (5) per cent stock dividend.

American Viscose Corporation stockholders approved the proposal to acquire Sylvania Industrial Corporation at a meeting held on August 6, at which time they also voted to increase the authorized common stock from 2,000,000 to 2,500,000 shares. Sylvania Industrial Corporation stockholders approved the proposal at a meeting held on August 26.

Both companies use cellulose as a principal raw material and employ related manufacturing and chemical processes, although their products are non-competitive. American Viscose Corporation manufactures rayon yarn and staple fiber. Sylvania Industrial Corporation manufactures cellophane, cellulose casings for meats, self-sealing viscose bands for bottle tops, textile sizes and finishes, and plastic molding compounds.

American Viscose Corporation has seven plants located in Pennsylvania, Virginia and West Virginia, and employs 21,000 people. Sylvania Industrial Corporation has one plant, which is at Fredericksburg, Va., and employs approximately 2,000 people.

• BULLETIN, CREASE RESISTANT FINISH

Publication of an important bulletin describing the use of Aerotex Cream 450 has been announced by the Textile Resin Department of the American Cyanamid Company.

Aerotex Cream 450 is said to be one of the chief resins used for crease resistant finishes, particularly on spun rayon and spun rayon mixtures of acetate, aralac or cotton. It has also been a popular resin for crease proofing linens as well as certain cotton fabrics, particularly voiles, and it is an important component for durable glazed chintz effects on cotton.

The bulletin (Textile Finishing Bulletin 115) is available upon application to the Textile Resin Department, American Cyanamid Company, at Bound Brook, N. J.

Proceedings of the
American Association of Textile Chemists and Colorists

SEPTEMBER 23, 1946

Officers of the Association

WILLIAM D. APPEL, *President*
National Bureau of Standards, Washington, D. C.

HUGH CHRISTISON—HENRY F. HERRMANN, *Vice-Presidents*

WILLIAM R. MOORHOUSE, *Treasurer*
National Aniline Division, Allied Chemical & Dye Corp., Boston, Mass

HAROLD C. CHAPIN, *Secretary*
Lowell Textile Institute, Lowell, Mass.

LOUIS A. OLNEY
President Emeritus and Chairman of the Research Committee
Lowell Textile Institute, Lowell, Mass.

HAROLD W. STIEGLER
Director of Research
Lowell Textile Institute, Lowell, Mass.

COUNCILORS
Representing Sections

HOWARD V. KING; ALLISON R. FLETCHER HAROLD B. STURTEVANT (Rhode Island)
JAMES P. CONAWAY; ARTHUR W. ETCHELLS, BOYCE C. BOND, PERCIVAL THEEL (Philadelphia)
PATRICK J. KENNEDY; ROY G. BUCK; LEONARD S. LITTLE; THOMAS F. O'BRIEN.
GEORGE L. BAXTER; A. G. ASHCROFT (New York)
EDWARD S. CHAPIN; WALTER J. HAMBURGER; CHARLES H. A SCHMITT (N. New England)
SIDNEY M. CONE; RAPHAEL E. RUPP; SAMUEL L. HAYES (Piedmont)
W. B. GRIFFIN (South Eastern)
MAX Y. PARKER (South Central)
HERBERT W. TETZLAFF; ARTHUR T. BRAINERD (Midwest)

Past Presidents

ELVIN H. KILLHEFFER; P. J. WOOD; ROBERT E. ROSE; WILLIAM H CADY; ALBAN EAVENSON; CARL Z. DRAVES; THOMAS R. SMITH

Standing Committees of the Council and their Chairmen

Executive Committee on Research
Leonard S. Little, Chairman

Publicity
Winn W. Chase, Chairman

Appropriations
William R. Moorhouse, Chairman

Membership and Local Sections
Hugh Christison, Chairman

Publications
Louis A. Olney, Chairman

Corporate Memberships
Henry F. Herrmann, Chairman

Local Sections and Their Officers

Northern New England Section
George O. Linberg, Chairman, E. I. du Pont de Nemours & Co., Inc., 140 Federal St., Boston 10, Mass.
Azel W. Mack, Secretary, Dexter Chemical Corp., 581 Boylston St., Boston 16, Mass.
Frank J. Rizzo, Vice-Chairman; Martin H. Gurley, Jr., Treasurer

Rhode Island Section
George H. Wood, Jr., Chairman, 40 Valentine Circle, Apponaug, R. I.
James C. Shore, Secretary, 324 Weeden St., Pawtucket, R. I.
Robert W. Joerger, Vice-Chairman; Robert R. Farwell, Treasurer

New York Section
Dr. Herman E. Hager, Chairman, General Dyestuff Corp. 435 Hudson St., New York 14, N. Y.
Norman A. Johnson, Secretary, American Dyestuff Reporter One Madison Ave., New York 10, N. Y.
Charles W. Dorn, Vice-Chairman; John H. Hennessy, Treasurer

Philadelphia Section
Curt R. Baeringer, Chairman, 5936 Castor Ave., Philadelphia 24, Pa.
A. E. Raimo, Secretary, John Campbell & Co., S. E. Corner Broad and Spring Garden Sts., Philadelphia 23, Pa.
Walter F. Fancourt, Vice-Chairman; Arthur M. Gordon, Treasurer

Piedmont Section
Leland G. Atkins, Chairman, Southern Dyestuff Corp., Charlotte, N. C.
John B. Neely, Secretary, Burlington Mills, Yarn Dyeing Div., Burlington, N. C.
Wyss L. Barker, Vice-Chairman; Roy J. Beauregard, Treasurer

South Central Section
Clyde J. Horne, Chairman, Dixie Mercerizing Co., Chattanooga, Tenn.
Allan James Nelson, Secretary, Springfield Woolen Mills Co., Springfield, Tenn.
W. K. Newman, Vice-Chairman; Bernhard Borrmann, Treasurer

Midwest Section
Al. J. Feit, Chairman, E. I. duPont de Nemours & Co., Inc 7 S. Dearborn Street, Chicago, Ill.
George B. Chabot, Jr., Secretary, Calco Chemical Division, American Cyanamid Co., 146 W. Kinzie Street, Chicago, Ill
George E. Osha, Vice-Chairman; Joseph H. Jones, Treasurer

South-Eastern Section
A. Kempton Haynes, Chairman, Rohm & Haas Co., Inc., 1811 Meadowdale Ave., N. E., Atlanta, Ga.
Howard M. Waddle, Secretary, West Point Mfg. Co., Shawmut, Ala.
Matthew T. Barnhill, Vice-Chairman; Allyn J. Morse, Treasurer

STUDENT CHAPTERS

Lowell Textile Institute
North Carolina State College
Philadelphia Textile Institute
New Bedford Textile School

Members should notify the Secretary immediately of all address changes

Plans for Intersectional Contest

PATRICK J. KENNEDY, chairman of the national Intersectional Contest Committee, has announced that all sections will present papers in this year's contest which will be held in conjunction with the Silver Jubilee Convention in Boston, December 12-14. Some of the papers are even now almost completed and Mr. Kennedy has indicated that members have shown an unusual interest in the preparation of them. Papers of outstanding importance to the industry will be presented at this contest.

Other members of Mr. Kennedy's national committee are:

Kenneth H. Barnard of the Textile Resin Department of American Cyanamid Company and former chairman, for a number of years, of the Intersectional Contest Committee;

Winn W. Chase of the Aridye Corp. and chairman of the publicity committee of the national association;

J. Robert Bonnar of General Dyestuff Corp. and secretary of the Executive Committee on Research; and

Frank J. O'Neil of the Pacific Mills who represents the national committee in Boston.

The chairmen of the committees representing the various sections have also been announced by Mr. Kennedy as follows:

Rhode Island Section—Alden D. Nute of the American Cyanamid Company;

Northern New England Section—Sawyer Sylvester, chemist of the Monsanto Chemical Company;

New York Section—Werner von Bergen, director of the research and control laboratory of the Forstmann Woolen Company;

Philadelphia Section — Dr. Miles A. Dahlen, assistant director of sales of the dyestuff division, E. I. duPont de Nemours & Co., Inc.;

Piedmont Section — Peter S. Gilchrist, Jr., chemist and development engineer of the Charlotte Chemical Laboratories;

South Central Section—C. E. Bachelder, superintendent of the acetate rayon yarn division of the Tennessee Eastman Corp.;

Mid-West Section—E. J. Siegrist, assistant superintendent of the Holeproof Hosiery Company.

Southeastern Section — Matthew T. Barnhill, superintendent of dyeing of the Avondale Mills.

OCTOBER 26th MEETING SOUTHEASTERN SECTION

THE October 26th meeting of the Southeastern Section will be held at the Ansley Hotel, Atlanta, Georgia. The program consists of a discussion of "The Use of Cupriethylenediamine in Measuring the Degradation of Cellulose" by Dr. Howard M. Waddle, Head of the Chemical Department, Research Division, West Point Manufacturing Co., Shawmut, Alabama; and "Twenty Minutes of Magic" by Dr. Ralph Hefner, Dean of General Studies at the Georgia School of Technology, Atlanta, Georgia.

The effect of chemical attack on cellulose is a problem which concerns the man in the mill. It is well to know the extent of tendering caused by the bleaching methods used in the mill. For research work on bleaching operations it is imperative to know the extent of degradation. Dr. Waddle and his associates have adapted the use of cupriethylenediamine as a solvent to replace cuprammonia for this purpose.

The "Twenty Minutes of Magic" is an entertainment feature and consists of magic tricks. Dr. Hefner belongs to the Atlanta Society of Magicians.

MEMBERSHIP APPLICATIONS

SENIOR

Otto J. Agricola—Asst. Service Manager, Aridye Corp., Fair Lawn, N. J. Sponsors: H. A. Young, W. W. Chase.

Emily W. Akin—Instructor in Textiles, College of Home Economics; Univ. of Maryland, College Park, Md. Sponsors: A. R. Macormac, L. I. Weiner.

Walter N. Akst—Colorist, Myers Process, Brooklyn, N. Y. Sponsors: M. W. Akst, C. Lederer.

John W. Barton—Master Dyer, R. B. Dutt & Co., Philadelphia, Pa. Sponsors: W. O. Neeb, J. W. Huber.

Howard A. Beaton—Secretary, S & M Dye Works, Inc., Philadelphia, Pa. Sponsors: A. M. Gordon, R. L. Jones.

Thomas E. Bonaccorsi—Overseer of Finishing Dept., United Elastic Corp., Lowell, Mass. Sponsors: E. W. Birdsall, E. C. Hilton.

Arthur E. Bride—Salesman, Ciba Co., Inc., Philadelphia, Pa. Sponsors: R. W. Davie, C. Baeringer.

Remus F. Caroselli — Laboratory Technician, Owens-Corning Fiberglas Corp., Ashton, R. I. Sponsors: R. R. Farwell, W. H. Hutchison.

Frank Cutter—Sales Statistician, Rumford Chemical Works, Rumford, R. I. Sponsors: A. H. Razee, F. H. Casey.

Newton I. Day—Dyer, Collins & Aikman Corp., Roxboro, N. C. Sponsors: G. P. Cunier, W. C. Parker.

Johannes C. de Hullu—Colorist, Textile Mill N. V. Bontweverij "De Batavier," V/H J. Willink & Paschen Zonnebrink 12, Winterswijk (Holland). Sponsors: W. B. Wilson, H. F. Hermann.

Robert M. Denny — Textile Chemist, Graniteville Co., Gregg Div., Graniteville, S. C. Sponsors: J. C. King, J. R. Daniel.

Harry C. Donaldson, Jr.—Supt. Control & Testing Div., Research Dept., Cluett Peabody & Co., Inc., Troy, N. Y. Sponsors: L. S. Lang, J. Epelberg.

Jerome P. Donnelly—Vice President, Forrest Piece Dye Works, Inc., Easton, Pa. Sponsors: W. O. Neeb, T. H. Hart.

Richard C. Dowling—Chemist, Phillipsburg Textile Print Works, Phillipsburg, N. J. Sponsors: A. M. Gordon, A. E. Raimo.

John P. Easley—Owner, Pacific Textile Co., Inglewood, Calif. Sponsors: D. F. Driscoll, C. H. A. Schmitt.

Gordon S. Eaves—Dyer, Anchor Mills Co., Huntersville, N. C. Sponsors: T. E. White, C. F. Gibson.

Harry M. Fry—Chemist, Magee Carpet Co., Bloomsburg, Pa. Sponsors: J. Dixon, H. E. Millson.

Roland K. Gagnon — Asst. Technician, Works Laboratory, Owens Corning Fiberglas Corp., Ashton, R. I. Sponsors: R. R. Farwell, W. H. Hutchison.

George M. Gantz — Research Director, Lonsdale Co., Lincoln Bleachery & Dye Works Div., Lonsdale, R. I. Sponsors: J. Moore, A. W. Mack.

Forrest B. Gardner—Pres. & Treas., Advance Thread Corp., Hendersonville, N. C. Sponsors: S. L. Hayes, A. R. Thompson.

Roger J. Gentilhomme—Q.M. Corps Inspection, U. S. Army Q.M. Depot, Boston, Mass. Sponsors: D. E. York, I. S. Hurd.

Herbert P. Glover — Textile Chemist, Graniteville Co., Gregg Div., Graniteville, S. C. Sponsors: J. C. King, J. R. Daniel.

Frank Gonet—Senior Chemicals Specialist, U. S. Tariff Com., Washington, D. C. Sponsors: C. W. Schoffstall, C. M. Hunt.

Walter P. Green, Jr.—Research Chemist, Calco Chemical Div., American Cyanamide Co., Bound Brook, N. J. Sponsors: C. L. Zimmerman, R. D. Vartanian.

Alfred E. Grimm—Asst. Dyer, United Wool P. D. & F. Co., Passaic, N. J. Sponsors: H. H. Todebush, K. E. Leslie.

Emil R. Grimm—Dyer, Vice Pres., and Treas., United Wool P. D. & F. Co., Passaic, N. J. Sponsors: H. H. Todebush, K. E. Leslie.

Executive Committee

WALTER J. HAMBURGER
Fabric Research Labs., Inc.
Technical Program Chairman

GEORGE O. LINBERG
E. I. duPont de Nemours & Co., Inc.
General Chairman

PHILIP S. DURFEE
W. C. Durfee Company
Finance Chairman

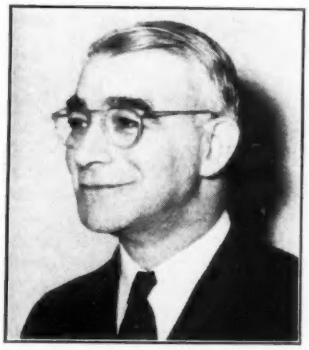
EDWARD S. CHAPIN
W. C. Durfee Company
Reception Chairman

HARRY M. HARTNETT
General Dyestuff Corp.
Hotel Chairman

JOSEPH A. BRYANT, JR.
Bryant Chemical Corp.
Dining Chairman

DELBERT E. RAY
Mass. Mohair Plush Co.
Exhibits Chairman

AZEL W. MACK
Dexter Chemical Corp.
Printing, Registration and Personnel Chairman



HYMAN P. SELYA
Sagamore Color & Chemical Co.
Publicity Chairman

Silver Jubilee Convention

Report of the Nominating Committee

THE Councilors representing Sections, in their capacity as Nominating Committee, have directed the Secretary to report the following nominations for the election of 1946:

For President, Henry F. Herrmann

For Vice Presidents, John N. Dalton and C. Norris Rabold

Under the Constitution, additional nominations, each signed by at least twenty-five Senior members, filed with the Secretary not later than October eighth, will be given equal standing on the ballot.

Respectfully submitted,
Harold C. Chapin, Secretary

Employment Register

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information through the code numbers from the Secretary.

46-5

Education: Lowell Textile School, Night. Chemistry, 1942.
Experience: Hosiery dyeing and finishing.
Age 29; married; references.

46-7

Education: Graduate, Bradford Durfee Textile School, 1933.
Experience: Five years as Textile Engineer, developing Non-woven fabrics.
Age 31; married; 3 dependents; references.

46-9

Education: Graduate, Philadelphia Textile Inst., Chem. & Dye.
Experience: Inspector. Quartermaster Corps. Staff Sgt., U.S.A.A.F., Sta. Chief. Meteorology.
Age 24; married; references.

46-10

Education: B. S., Pratt Inst.
Experience: Leather finishing. U. S. Army Medical Corps, Pharmacist, C. W. S. Instructor. Lab. application work on textile chemical specialties. Development of colors in laboratory and pilot plant. Interested in tech. sales service.
Age 31; single.

46-11

Education: PhD. Chem. Engg., Geneva, Switzerland.
Experience: Chief Chemist of Textile Mills, silk and cotton.
Age 57; single; references.

46-12

Education: Graduate New Bedford Textile School, 1945.
Experience: Laboratory technician, chemical, and physical testing.
Woman, age 20, single; references. Employment near Atlanta, Ga., preferred.

46-14

Education: B.S., Brooklyn College, 1934. courses in New York Textile High School, Brooklyn Polytechnic Inst., Columbia University.
Experience: Textile Technologist and Chief Chemist, analytical and testing.
Age 34; married; references.

46-15

Education: High school.
Experience: Leather and fur dyeing. 28 years.
Age 52; married.

46-16

Education: High school; Lowell Textile Evening School; N. H. State Univ., extension course.
Experience: 21 years dyeing cotton and mixtures, and hosiery.
Age 46; married; references. North preferred.

46-17

Education: Temple University.
Experience: Dyer, considerable variety of fibers and materials, 18 years.
Age 39; married; references. Will work anywhere in U. S.

46-18

Education: graduate Lowell Textile Institute, high standing, 1946.
Experience: two summers in textile plant laboratories.
Age 25; veteran; unmarried.

46-19

Education: R. I. School of Design, night course in chemistry & dyeing.
Experience: Ten years dyeing cotton goods.
Age 29; married; northeast U. S. preferred.

CALENDAR OF COMING EVENTS

SUB-COMMITTEES
Meetings: September 26
(Hotel Commodore, New York)

COUNCIL:
Meeting: September 27
(Hotel Commodore, New York)

RESEARCH COMMITTEE:
Meeting: September 27
(Hotel Commodore, New York)

PHILADELPHIA SECTION:
Meetings: September 27, November 15, January 17, February 28, April 11, May 23.

NEW YORK SECTION:
Meeting: October 18
(Swiss Chalet, Rochelle Park, N. J.)
Meetings: November 22, January 31, March 7, May 2

MID-WEST SECTION:
Meeting: October 19
(Belmark Hotel, Chicago)

PIEDMONT SECTION:
Meeting: October 26
(Charlotte, N. C.)

SOUTHEASTERN SECTION:
Meeting: October 26
(Ansley Hotel, Atlanta)

NATIONAL CONVENTION:
Silver Jubilee Convention: December 12, 13, and 14.
(Hotel Statler, Boston)

HOTEL RESERVATIONS

PLANS for the Silver Jubilee Convention in Boston are progressing under the leadership of George O. Linberg, General Chairman. Early in October each member will receive a card on which he can specify the type of hotel accommodation desired. All requests for hotel reservations are to be handled by the Housing Bureau, 80 Federal Street, Boston, Mass. Reservations will be acknowledged from this office and assigned to various hotels which will, in turn, give a direct confirmation on each reservation. We would suggest that members do not contact the hotels directly on room reservations. The Committee feels that ample hotel space will be available.

SANDOZ PRESENTS *The color achievement of the month*

Home Beautiful BY TULA

This stunning hostess gown of romaine crepe, gilded with imported Swiss lace, invites compliments to the girl... and to Tula for the artful design, to Shields for the fabric, and to the finisher — Cliffside Dyeing Corp. — for the clear, true color.

As with so many of the fabrics carrying the brands most familiar to shoppers everywhere — from negligees to upholstery, from socks to carpets — credit for the color can be shared by Sandoz, supplier of unimpeachable colors and chemicals.

Up-to-the-minute in its appreciation of fashion's exactitude... faithful to high technical standards which are continually being raised in its own laboratories... Sandoz offers the textile industry the most in color.

For example, Visco Milling Scarlet GFL, a brilliant new scarlet, has unusual fastness to washing, either direct or after-treated with formaldehyde and acetic acid. It is stable to urea formaldehyde finishes without effect on light fastness. And it has exceptional fastness to fulling when used on rayon waste for blending in woolen fabrics.

For acid, chrome or direct dyes... or auxiliary chemicals... for both natural and synthetic fibres... be guided by the successful "color achievements" you have been seeing in these Sandoz advertisements.

Sandoz application laboratories are located in New York, Boston, Philadelphia, Los Angeles, Charlotte, Toronto, where stocks in wide range are carried. Other branches are in Chicago, Paterson and Providence.

SANDOZ CHEMICAL WORKS, INC., 61 VAN DAM STREET, NEW YORK 13, N.Y.

SAND *thinks ahead with textiles* SANDOZ

DESIZE WITH EXSIZE

The Winning Finish!

YOU'RE BOUND to be way out in front if you finish your fabrics with EXSIZE... the desizer which is a concentrate of natural enzymes, with no trace of harsh alkalis, acids, or destructive chemicals.

EXSIZE works quickly, gently, gives a soft elastic feel, uniform absorbency . . . a good "hand." And what's more a few cents' worth will desize hundreds of yards of cotton or cotton-mixed goods.

Why not have our Pabst Technical Man show you the advantages of this famous desizer right in your own mill . . . or use our laboratories for your tests? We'll be delighted to send free booklet on request.

PABST BREWERIES

Copr. 1946, Pabst Brewing Company, Milwaukee, Wisconsin.

PABST SALES COMPANY
CHICAGO, ILLINOIS
Warehouses at Jersey City, and Textile Warehouse Company, Greenville, S. C.

BURK-SCHIER WET-PROCESSING AGENTS

for every textile application

AT YOUR SERVICE

Burkart-Schier Chemists and Technical Service Men are available at all times to cooperate with the Textile Industry in its processing problems

BURKART-SCHIER CHEMICAL CO.

BURK-SCHIER CHATTANOOGA, TENNESSEE BURK-SCHIER

PENETRANTS • SOFTENERS • SOLUBLE OILS • FINISHES

QUALITY RICHMOND PRODUCTS

Less Handling with

AFTER CHLOR

Eliminates 3 to 5 Handlings

Bleach with Hypochlorite Rinse and Use

AFTER CHLOR

THAT'S ALL!

Write for FREE Sample

RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
1041-43 FRANKFORD AVE., PHILADELPHIA 25, PA.

"WAPACO" PRODUCTS
Serve the Textile Industry

WATSON-PARK CO. Wapaco Leads BOSTON, MASS.

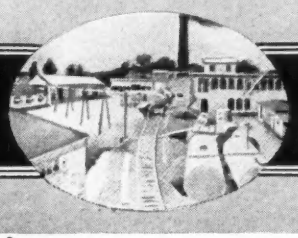
DYESTUFFS
CHEMICALS
TEXTILE SOAPS
TEXTILE OILS
STRIPPING COMPOUNDS

CALEX CRYSTALS
(Calgon Agglomerated)

For years this outstanding product has assisted mills in obtaining peak production in the dyeing and finishing operations.

INSTANTLY SOLUBLE, it saves labor when today labor costs are a chief factor in the ultimate price of a fabric.

For treating pulled wool, hard water conditions, and as a soap saver, CALEX CRYSTALS has no equal.



Factory
LOWELL JCT.
MASS.

WATSON-PARK COMPANY
261 FRANKLIN STREET • BOSTON, MASS.

BORNE SCRYMSER COMPANY · ELIZABETH, N.J. TINTINOL

BORNE SCRYMSER COMPANY · ELIZABETH, N.J. MINOTINT

TEXTILE PROCESS COMPOUNDS

MINOTINTS

Oil-base fugitive tints for all synthetic and natural fibers. Identification—Lubrication—Conditioning.

RAYON OILS
TINTINOLS
LYNOL

SS BASE OIL
MINEROL
MEON

BRETON OILS FOR WOOL

BORNE SCRYMSER CO.

Offices and Works
Elizabeth, N. J.

Est. 1874

Southern Warehouse
Charlotte, N. C.

RAPIDASE

for de-sizing cottons, rayons and mixed goods

•

Assures rapid, dependable de-sizing.

•

Our technical staff always at your service.

•

WALLERSTEIN COMPANY, INC.
180 MADISON AVENUE • NEW YORK 16

Manufacturers of

ANILINE -- ALIZARINE -- CHROME

and

ACETATE DYESTUFFS

FUGITIVE WOOL TINTS
FINE ORGANIC PIGMENTS
TANNIC ACID and CHEMICALS

Our laboratories are always at your service

ZINSSER & COMPANY, Inc.
ESTABLISHED 1897
Manufacturing Chemists
HASTINGS-ON-HUDSON NEW YORK

QUALITY RICHMOND PRODUCTS

CUT DOWN DYEHOUSE
Headaches
USE

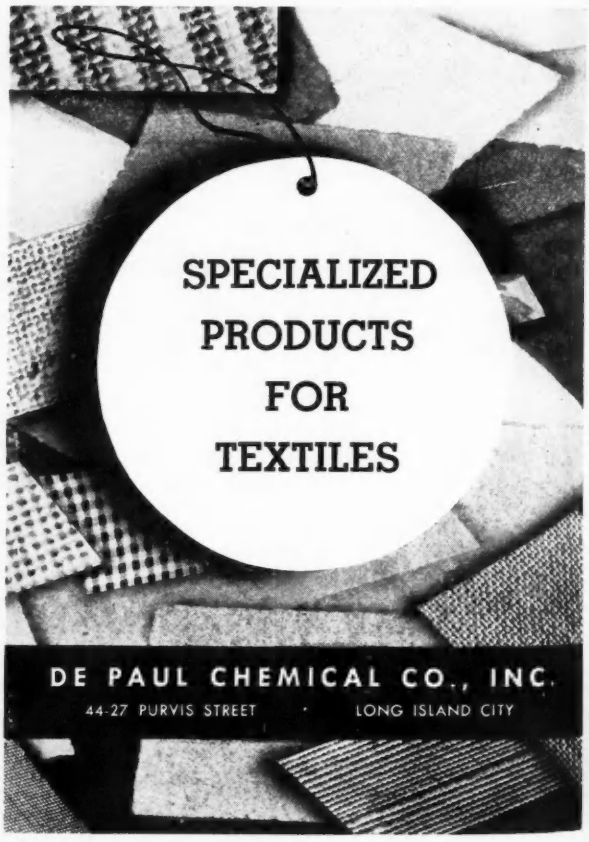
DYETEX

- Disperses Dyestuff
- Scours
- Used in Scrooping

DYETEX

Send for free sample and full information

RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
1041-43 FRANKFORD AVE., PHILADELPHIA 25, PA.



IT'S SOUND RESINING...

TO USE

ATCO RESINS

#400 AND #150

UREA-FORMALDEHYDE RESINS

WE'VE USED 'EM...
WE'VE PROVED 'EM!

ASK the plants who use them (and they are many) and they'll tell you that ATCO RESINS are tops for use in *shrinkage control, permanent finish* and *creaseproofing.*

You'll hear how any desired hand, stiff or soft, can be obtained by balancing the two ATCO RESINS.

ATCO RESINS are easily soluble, cure readily, have no odor and assure excellent finishes.

ATCO RESINS can be used for T.B.L.

Ask for ATCO RESINS bulletin 4-F.

Use ATCO Products

Atlantic Chemical Co.

MAIN PLANT: CENTREDALE, RHODE ISLAND

BRANCH OFFICE: PATERSON, NEW JERSEY

TRUE BLUES without the 'blues'

JUST USE

SOLVAY SODIUM NITRITE

IN THE PREPARATION OF AZO dyes of any color of blue for cotton, rayon or silk, SOLVAY Sodium Nitrite gives you the best possible results . . . and color fastness at minimum cost. Of U.S.P. Grade, this fine crystal tends to remain free-flowing. Its high quality and purity were expressly developed for the making of azo dyes and for fine textile dyeing.

For color-right quality dyes, specify SOLVAY Sodium Nitrite.

SOLVAY

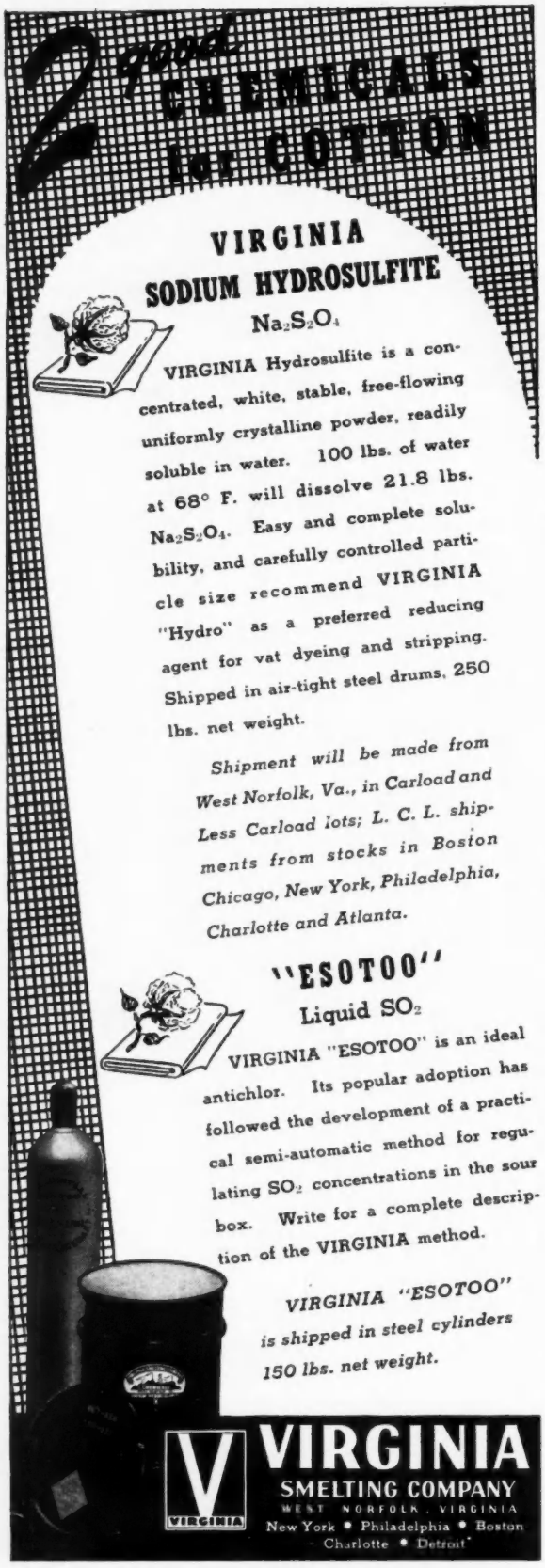
SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

40 Rector Street — New York 6, N. Y.

BRANCH SALES OFFICES:

Boston • Charlotte • Chicago • Cincinnati • Cleveland
Detroit • Houston • New Orleans • New York
Philadelphia • Pittsburgh • St. Louis • Syracuse


2 great CHEMICALS for COTTON
VIRGINIA
SODIUM HYDROSULFITE
$Na_2S_2O_4$
VIRGINIA Hydrosulfite is a concentrated, white, stable, free-flowing uniformly crystalline powder, readily soluble in water. 100 lbs. of water at 68° F. will dissolve 21.8 lbs. $Na_2S_2O_4$. Easy and complete solubility, and carefully controlled particle size recommend VIRGINIA "Hydro" as a preferred reducing agent for vat dyeing and stripping. Shipped in air-tight steel drums, 250 lbs. net weight.
Shipment will be made from West Norfolk, Va., in Carload and Less Carload lots; L. C. L. shipments from stocks in Boston Chicago, New York, Philadelphia, Charlotte and Atlanta.
"ESOTOO"
Liquid SO_2
VIRGINIA "ESOTOO" is an ideal antichlor. Its popular adoption has followed the development of a practical semi-automatic method for regulating SO_2 concentrations in the sour box. Write for a complete description of the VIRGINIA method.
VIRGINIA "ESOTOO" is shipped in steel cylinders 150 lbs. net weight.
VIRGINIA
SMELTING COMPANY
WEST NORFOLK, VIRGINIA
New York • Philadelphia • Boston
Charlotte • Detroit

• CLASSIFIED ADVERTISEMENTS •

CONFIDENTIAL EMPLOYMENT SERVICE — We invite correspondence (confidential) with Dyers, Chemists, Colorists, Superintendents, Master Mechanics, Office Managers, and others seeking positions and with employers seeking high-grade men to fill vacancies or to make replacements. Charles P. Raymond Service, Inc., 294 Washington St., Boston, Mass. Over 45 years in business.

POSITION WANTED: Textile chemist desires position with small dyestuffs or chemical company. Lowell Textile Institute graduate; one year's experience; veteran. Write Box 114.

WANTED: Sulphur Black, Sulphur Navy, Ponsol Blues, all cotton dyestuffs, spot and future shipments. Write Box 112.

POSITION WANTED: Technical assistant to plant manager. Capable of handling development of new methods and processes in greige mills and finishing plants. Experience includes cotton, wool, silk and synthetics on yarns, cords and fabrics. Write Box 109.

Attention Dyestuff Manufacturers and Distributors. Are you interested in contacting a man who has 20 years dyestuff and chemical experience in both technical and representative capacities? Write Box 115.

POSITION WANTED: Graduate of Textile School of Dyeing and Chemistry. Interested in developing Eastern interests who wish to locate a dyeing and finishing plant in Los Angeles, California. Expert dyer and finisher of all types of piece goods. Now located in Los Angeles, ready to receive instructions to start work. Box 118.

POSITION WANTED: Laboratory Assistant—Textile Colorist—Young, ambitious, accurate, dependable, would like position in textile laboratory of progressive dyehouse or with dyestuff or chemical specialties manufacturer. Philadelphia Area. Box 120.

POSITION WANTED: Textile chemist and colorist; over 17 years' experience in textile laboratory work. Thoroughly familiar with printing, dyeing and padding of all types of cloth. Also some resin experience. Desires position in technical sales or research. Capable of directing laboratory. Box 124.

WANTED: For Pennsylvania, Dyer on Rayon, Silk and Acetate Skein Dyeing. Must have knowledge of Textile Chemistry. Very promising future with a growing concern. State experience, references, age and salary expected. Replies held confidential. Box 126.

POSITION WANTED: Superintendent of Dyeing; 18 years' experience on all types of fibres in skein and narrow fabric forms. Would like opportunity to prove ability on skein or other types of dyeing. Box 125.

POSITION WANTED Chemist, formerly connected with large Dyestuff firm and Mill research laboratory. Laboratory and Mill experience in Dyeing, Finishing, Coating. Knowledge of new methods of dyeing and printing. Age 27, married, excellent references. Box 123.

POSITION WANTED: Colorist or assistant colorist; familiar with printing of all fibers. Experienced in screen and machine printings. College Chemistry. Married. Metropolitan New York or vicinity. Box 122.

YOUNG ANILINE WORKS
INCORPORATED

BROWNS

CHROME BROWNS EB and PG

For your Government and Civilian orders. Proven standards for the trade of exceptional uniformity and purity.

STOCKS CARRIED BY DYESTUFF DISTRIBUTORS IN ALL TEXTILE CENTERS

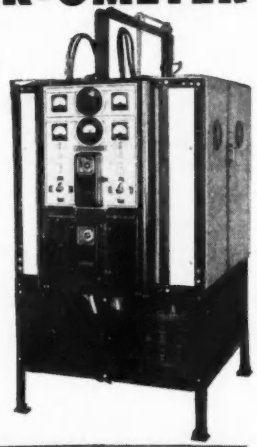
OFFICE and FACTORY
2701 Boston St., Baltimore, Md.

PATERSON, N. J. OFFICE
50 E. 13th St.

Mill operators know what the ATLAS FADE-OMETER and LAUNDER-OMETER have done for the textile industry in predetermining the fastness to light and washing of textiles.

ATLAS WEATHER-OMETER

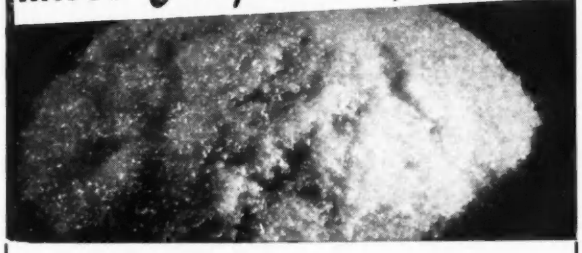
now has taken an equally important place in the industry for testing fabrics exposed to weathering under war conditions. The Weather-Ometer will accommodate large size specimens to meet the Federal specifications demanding accelerated tests.



ATLAS ELECTRIC DEVICES CO.
361 W. Superior St.
Chicago 10, Ill.

ATLAS-OMETERS
WEATHER-OMETER
LAUNDER-OMETER ★ FADE-OMETER

RAYCO "Cellophane Spangles"



Dot Printing with Spangles NEW, NOVEL, STRIKING!

Give your fabrics the sparkling brilliance of "Spangling" with Rayco Cellophane Spangles. Startling effects produced at reasonable cost, put your novelty fabrics in a class by themselves.

Request Sample of "Spangles"

RAYON PROCESSING CO. of R. I. INC.
91 Tremont Street, Central Falls
Rhode Island

10 PRODUCTS of Proven Dependability

WHICH SHOULD WARRANT ★ YOUR ATTENTION ★

***AQUAROL :** A water repellent for processing woolen, cotton and rayon fabrics, also produces excellent results in splashproofing or finishing all types of hosiery.

***PARAMINE S :** A cation active softener for processing cotton and rayon cloth to obtain a soft, smooth, pleasing finish.

***ALGEPON S :** An assistant in dyeing vat colors to prevent premature oxidation of the reduced bath and eliminate uneven dyeings.

***ALGEPON V A :** Assistant for stripping vat colors—complete reduction of color in stripping bath providing lighter bottom for redyeing.

***PARAPON S A :** A highly efficient leveler and softener for dyeing and finishing all types of yarn, cloth and hosiery to produce a uniform dyeing and a soft full hand.

***ARIPEL F S :** Finish and gas inhibitor for processing dyed acetate rayon—produces a soft full feeling finish and prevents gas fading of the color.

***LANITOL F :** A synthetic detergent possessing exceptional scouring and washing properties for processing wool, cotton, rayon or nylon.

***CULOFIX :** Used as an after treatment in last rinse to prevent bleeding of direct dyed cotton or rayon in water.

***DIAZONOL A C :** For boiling out cotton cloth in pressure or open kiers to produce greater absorbency and cleaner material. Excellent for preboiling knitted cloth in preparation for chlorine bleach. Also used with good results for boiling out cotton or rayon cloth on the jig.

***TETRANOL 1638 :** A rapid wetting and penetrating agent. Active in acid, alkaline and salt solutions and not affected by hard water, may be used in all types of dyeing operations to insure positive penetration of color and a uniform and solid shade.

And a Complete Line of Oils, Chemicals, Softeners and Finishes For Wet Processing All Textile Fibres

*Reg. U.S. Pat. Off.

ARKANSAS CO. Inc.

Newark, New Jersey

ESTABLISHED OVER 40 YEARS

INDEX TO ADVERTISERS

Alrose Chemical Co	
Althouse Chemical Co	
Amalgamated Chemical Corp	
American Aniline Products, Inc	XXI
American Cyanamid Co. (Ind. Chem. Div.)	Second Cover
American Cyanamid Co. (Textile Resin Dept.)	XVIII
American Dyewood Company	
American Viscose Corp	
Ansul Chemical Company	
Aridye Corp	XIII
Arkansas Company, Inc	XXX
Arnold, Hoffman & Co., Inc	
Atlantic Chemical Co	XXVII
Atlas Electric Devices Co	XXIX
Bocco Sales Corp	
Bernard Color & Chem. Co	Third Cover
Bick & Co., Inc	
Blickman Co., S	
Borne Scrymser Co	XXV
Burkart-Schier Chemical Co	XXIV
Butterworth Sons Co., H. W	
Calco Chemical Division, American Cyanamid Co	
Calgon, Inc	
Campbell & Co., Inc., John	
Carbic Color & Chemical Co., Inc	XVI
Carbide & Carbon Chemicals Corp	IX
Ciba Company, Inc	III
Colgate-Palmolive-Peet Co	
Commonwealth Color & Chemical Co	
De Paul Chemical Co., Inc	XXVI
Drew & Co., E. F	
DuPont de Nemours & Co., E. I	
Dyestuff Division	
Fine Chemicals Div	
Electro Metallurgical Co	
Emery Industries, Inc	
Exact Weight Scale Co	
Fancourt & Co., W. F	IV
Geigy Company, Inc	Front Cover
General Chemical Co	X
General Dyestuff Corp	V
Givaudan-Delawanna, Inc	
Hart Products Corp	
Hercules Powder Co	
Heyden Chemical Co	
Hooker Electrochemical Co	
Houghton & Co., E. F	
Industrial Rayon Corp	
International Salt Co., Inc	VI
Johnson & Son, Inc., S. C	
Kali Manufacturing Co	
Kearny Mfg. Co	
Kelco Co	XXXI
Laurel Soap Mfg. Co., Inc	
Leatex Chemical Co	
Leeds & Northrup Co	
Mathieson Alkali Works, Inc	
Monsanto Chemical Co	VII
Myles Salt Co., Ltd	
National Aniline Division, Allied Chemical & Dye Corp	XIX
National Carbon Co	
National Oil Products Co	XII
National Starch Products, Inc	
Nova Chem. Co	
Nuodex Products Co., Inc	
Nyanza Color & Chemical Co	
Onyx Oil & Chemical Co	XXII
Pabst Sales Company	XXIV
Perkins & Sons, Inc., B. F	
Philadelphia Quartz C	
Procter & Gamble	
Rayon Processing Co. of R. I., Inc	XXIX
Refined Products Co	VIII
Richmond Oil, Soap & Chemical Co., Inc	XXIV, XXVI
Rohm & Haas Co	XXXII
Royce Chemical Co	Back Cover
Rumford Chemical Works	XV
Sandoz Chemical Works	XXIII
Scholler Bros., Inc	
Socony-Vacuum Oil Co., Inc	
Solvay Sales Corp	XXVII
Sonneborn Sons, Inc., L	
Standard Brands, Inc	
Standard Chemical Products, Inc	
Stein, Hall & Co., Inc	
Tennessee Eastman Corp	XI
Ultra Chemical Works	X
United Chemical Prod. Co	
Union Carbide & Carbon Corp	IX
Van Vlaanderen Machine Co	
Virginia Smelting Co	XXVIII
Wallerstein Co., Inc	XXV
War Assets Administration	
Watson-Park Company	XXV
Wolf & Co., Jacques	
Young Aniline Works	XXIX
Young Co., J. S	
Zinsser & Co., Inc	XXVI
Zurn Co., O. F	

Hunting scene...
Wherever fashions are shown, the hunt is on—for true, color-rich prints . . . bright, "clean" pastels — and KELTEX, the modern algin thickening agent, is your best assurance of true color. . . . deep, glowing tones and subtle shades.
KELTEX insures exact printing paste viscosity. It is perfectly adapted to the pad pigment method of vat dyeing — is equally excellent in machine and screen printing. KELTEX produces full, rich — true — color value . . . stops color migration . . . provides superior penetration.
KELTEX, a product of Nature, is free of dirt, grit, cellulose or other foreign matter. It is rigidly processed to produce consistent, exact results — and it's inexpensive too! Consult us on your thickening problems. Our Technical Department is at your service.
KELTEX
REFINED ALGIN PRODUCT
KELCO COMPANY
20 N. Wacker Drive CHICAGO-6
31 Nassau Street NEW YORK-5
530 W. Sixth Street LOS ANGELES-14
Cable Address: KELCOALGIN—New York

"TRITON 770 is the answer to a lot of my kier boiling problems."

THE SERVICE THAT BUILT OUR BUSINESS CAN HELP YOURS

Our business has been built largely on the practical help we have been able to give our customers, right in their own plants, in adapting Rohm & Haas products to their needs.

Our representatives are men with technical training and practical experience in the use of industrial chemicals. Call in a member of our textile chemicals department when you need assistance in choosing or using . . .

Chemicals For Quality Textiles

Mill men are often surprised to find out that TRITON 770 is much *more* than an efficient wetting agent.

TRITON 770 not only reduces boiling and draining time by as much as 50%, but also gives more uniform preparation, cleaner and whiter bottoms, maximum absorbency, and a minimum of kier stains. Its combination of superior properties speeds and improves most textile wet processing operations.

One sure way to know what's new and best in textile chemicals is to talk it over with Rohm & Haas representatives. Just let us know when you'd like one of our men to call . . . he'll be glad to give you new product information and complete data about dependable fine chemicals like . . .

TRITON 770

TRITON *is a trade-mark, Reg. U. S. Pat. Off.*

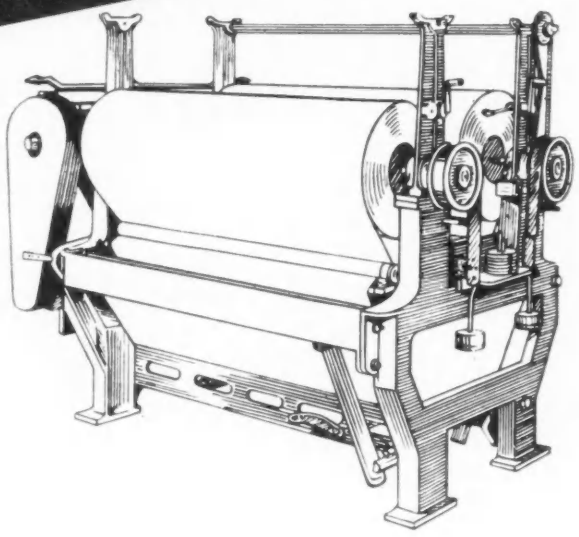
Represented in Canada by Rohm & Haas Company of Canada, Ltd., Toronto; and in South America by Cia. Rohm y Haas, S. R. L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Manufacturers of Chemicals for the Textile, Leather and other Industries . . . Plastics . . . Synthetic Insecticides . . . Fungicides . . . Enzymes

Level Dyes for Acetate Lining!



Selvedge to Selvedge Dyeing

Bernacet Blue 3RD

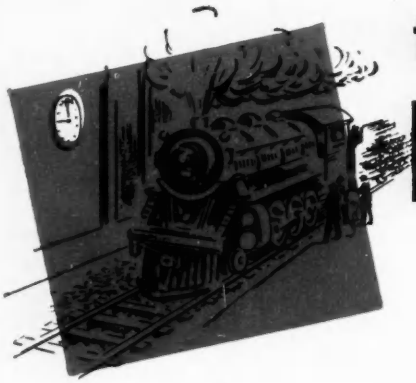
One of the new BERNACET COLORS for jig dyeing of acetate rayon lining material. Uniform blue is produced throughout the fabric at all dyeing temperatures.

BERNARD COLOR & CHEMICAL CORPORATION

"BERNCOLORS"

Bernard Color & Chemical Corp.

333 HUDSON ST. NEW YORK 13, N. Y.



this is regular performance...

this is regular performance without smoking

as found in VELVORAY No. 1*

(finishing oil)

VELVORAY No. 1 is a consistent performer in the softening and finishing of textiles of all types. And in subsequent operations of drying, tentering, schreinering, calendering or sanforizing, VELVORAY No. 1 *does not smoke.*

VELVORAY No. 1 produces uniform finishes because it doesn't foam. Level of finishing liquor—and quality of finish—can be *controlled.* VELVORAY No. 1 is consistent in action for the additional reasons that it is chemically stable, doesn't oxidize, turn rancid, or discolor fabrics. It's economical. Since no particle of VELVORAY No. 1 goes off in wasteful smoke, every drop stays on the goods, adding plumpness and quality "feel".

Approval from customers comes more regularly to mills using finishing oils of established regularity of performance. Ask a Royce man about the consistently good results mills are getting with VELVORAY No. 1 . . . on all kinds of fabrics . . . on yarns of natural or synthetic fibres . . . as a plasticizer and lubricant in warp sizing.

VELVORAY* No. 1 "GETS ALONG" WITH YOUR OTHER INGREDIENTS • VELVORAY No. 1 is compatible with starches, gums, gelatine, glues, and blueing agents commonly used in the textile industry.

ROYCE CHEMICAL CO.

ROYCE CHEMICAL CO.

CARLTON HILL, NEW JERSEY

MANUFACTURERS OF VATROLITE* • PAROLITE* MIRCOLITE* • CASTROLITE* • FABRITEX* • DUMCLITE* • NEOZYME*

*Registered Trade Mark

UNIVERSITY OF NEBRASKA AGRICULTURAL LIBRARY

DYESTUFF REPORTER

TOBER 7, 1946
LUME 35, No. 20

DIAGEN* YELLOWS AY and A2Y

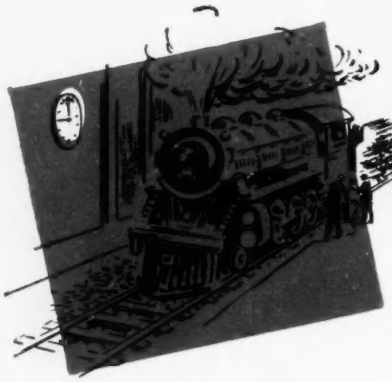
Both of these new stabilized azoic colors have good fastness to light and washing. They are especially recommended for decorative effects where brightness, ease of application, and low costs are important. Both have good solubility, stability in stock solutions, and non-specking qualities. When printed on cotton or viscose-process rayon, "Diagen" Yellow AY produces brilliant yellow shades. "Diagen" Yellow A2Y produces brilliant greenish-yellow shades. Each is supplied as a readily soluble powder or a 20% solution.

Our sales representative will gladly give you additional information about these two products and their uses. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

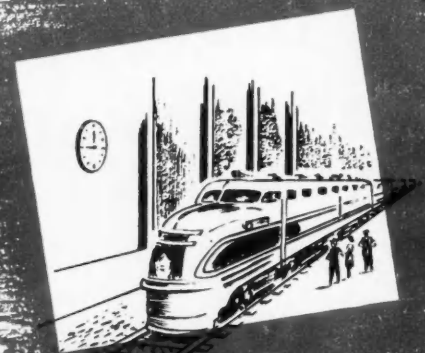
*REG. U. S. PAT. OFF.

Du Pont Dyestuffs DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



this is regular performance...



this is regular performance without smoking

as found in VELVORAY No. 1*

(finishing oil)

VELVORAY No. 1 is a consistent performer in the softening and finishing of textiles of all types. And in subsequent operations of drying, tentering, schreinering, calendering or sanforizing, VELVORAY No. 1 *does not smoke.*

VELVORAY No. 1 produces uniform finishes because it doesn't foam. Level of finishing liquor—and quality of finish—can be *controlled.* VELVORAY No. 1 is consistent in action for the additional reasons that it is chemically stable, doesn't oxidize, turn rancid, or discolor fabrics. It's economical. Since no particle of VELVORAY No. 1 goes off in wasteful smoke, every drop stays on the goods, adding plumpness and quality "feel".

Approval from customers comes more regularly to mills using finishing oils of established regularity of performance. Ask a Royce man about the consistently good results mills are getting with VELVORAY No. 1 . . .
on all kinds of fabrics . . . on yarns of natural or synthetic fibres . . .
as a plasticizer and lubricant in warp sizing.

VELVORAY* No. 1 "GETS ALONG" WITH YOUR OTHER INGREDIENTS • VELVORAY No. 1 is compatible with starches, gums, gelatine, glues, and blueing agents commonly used in the textile industry.

ROYCE CHEMICAL CO.

ROYCE CHEMICAL CO.

CARLTON HILL, NEW JERSEY

MANUFACTURERS OF VATROLITE* • PAROLITE* DISCOLITE* • CASTROLITE* • FABRITEX* • QUINOLITE* • NEOTYNE*

*Registered Trade Mark